



COAL RESOURCES OF WASHINGTON COUNTY, PENNSYLVANIA

PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS

Compiled by
Viktoras W. Skema

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Donald M. Hoskins, State Geologist



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Pennsylvania Geological Survey

PENNSYLVANIA GEOLOGICAL SURVEY
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1987

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al resources of Washington
ounty, Pennsylvania

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COAL RESOURCES OF WASHINGTON COUNTY, PENNSYLVANIA

PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS

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INTRODUCTION

An important function of the Bureau of Topographic and Geologic Survey is to provide accurate, timely information on Pennsylvania's bituminous coal. To achieve this goal, the Bureau is working in cooperation with the U.S. Geological Survey to establish the National Coal Resources Data System (NCRDS). NCRDS is a computer data system developed by the U.S. Geological Survey to facilitate coal-resource calculations for the nation on a county-by-county and seam-by-seam basis, and to produce various kinds of tables and maps of coal characteristics.

Before NCRDS can be used for a particular bituminous-coal-producing county, all available data on the coal must be entered into the computer system. These data include site-specific (point-location) stratigraphic measurements and coal analyses, and specific map elements compiled on 7½-minute topographic quadrangle maps. The map elements, which include coal outcrop lines, structure contours, and mined-out areas, are digitized and stored in the system for subsequent computer manipulations.

The maps in this report represent part of phase one of NCRDS for Pennsylvania. Phase two will include the various computer-generated tables and maps of coal characteristics for the state. As the data base for each county is completed and the various derivative tables and maps of coal quality are produced, their availability will be publicly announced.

Inasmuch as the maps showing coal outcrop lines and mined-out areas are in constant demand by the

coal industry, consultants, planners, government personnel, and academicians, they are being made available in this publication. These maps will be of considerable help in planning exploration programs, land acquisition, land use planning, and environmental protection.

Two kinds of coal maps may be included for each 7½-minute quadrangle covering Washington County (Figure 1). First, for each of the principal coal seams in a given quadrangle, there is an individual map showing (1) the coal outcrop (crop line), and (2) the extent of all known strip and deep mining up to the time of compilation (1985). Second, for each quadrangle, there is a composite map showing the crop lines of all of the principal coal seams (Figure 2), structure contours, and fold axes. Individual coal crop line maps were made for each of the two economically important coals in Washington County, the Pittsburgh and Waynesburg coals. The maps were made for all quadrangles where these coals cropped out, including quadrangles where no mining had taken place. Individual crop line maps of economically less important coals such as the Waynesburg "A" and the Washington were limited to only the quadrangles where these coals have been mined; however, complete county-wide coverage of the crop lines of these coals can be found on the composite maps. The Redstone coal is minable only in northeastern Washington County, where its extent of deposition is well defined. The horizon of the Redstone coal is shown on the composite maps only in the quadrangles where it can be traced. All of the maps contain information on sources of data, map reliability, and map symbols. In addition, the composite maps contain in-

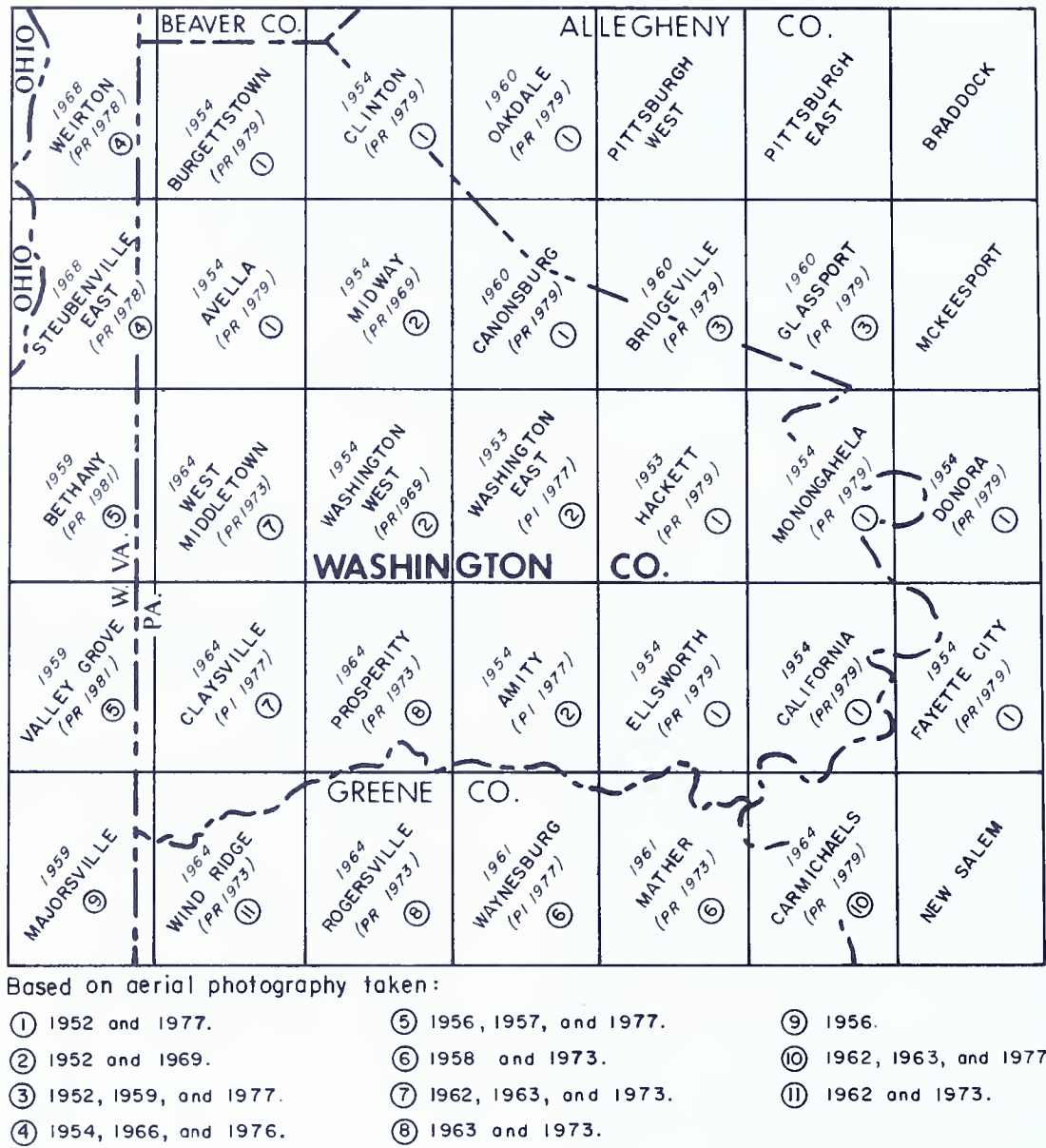


Figure 1. Index map of 7½-minute quadrangles in Washington County. Dates of publication of topographic quadrangle maps are shown in italic type. Dates of photorevision (PR) and photoinspection (PI) are shown in parentheses.

formation on structure-contour intervals and datums, and names of fold axes. The general layout of the compilation maps is shown in Figure 3.

The map reliability values given in this report are meant to be used as a general guide. The reliability of most of the coal crop lines and structure contours in Washington County is believed to be “very good,” which in this report is defined as having an approximate accuracy to within 20 feet (±10 feet)

vertically. A few crop lines and structure contours were judged to have “good” reliability, having an accuracy to within approximately 40 feet (±20 feet) vertically.

The reader is advised that all of the original compilation maps are available for public inspection at the offices of the Pennsylvania Geological Survey in Harrisburg. The scale of the original maps is 1:24,000.

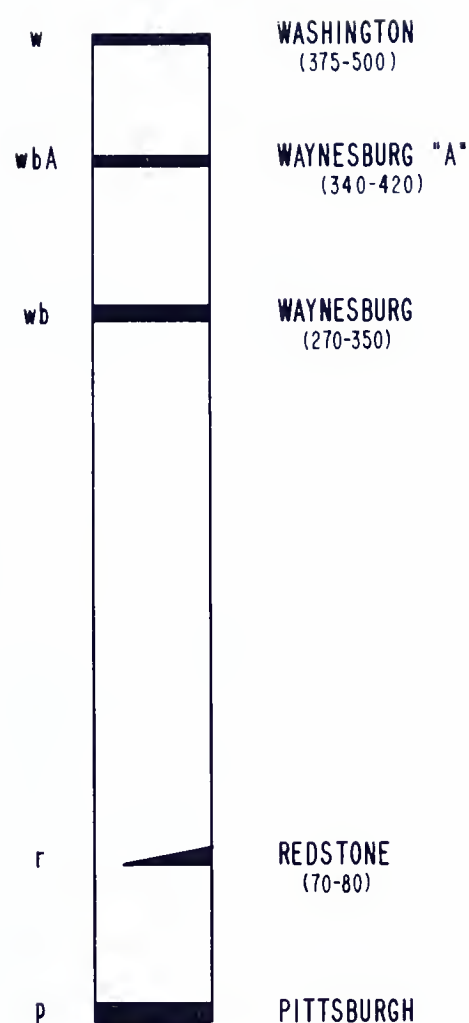


Figure 2. Stratigraphic position of the principal coal seams in Washington County. The intervals, in feet, to the Pittsburgh coal are given in parentheses. Thicknesses of the coal seams are not to scale.

The following list of references can be used to locate further information on the geology of Washington County and the quality of coal in the county.

REFERENCES

- Bench, B. M., Diamond, W. P., and McCulloch, C. M. (1977), *Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia*, U.S. Bureau of Mines Report of Investigations 8217, 35 p.
- Berryhill, H. L., Jr. (1964), *Geology of the Amity quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-296, scale 1:24,000.
- Berryhill, H. L., Jr., and Schweinfurth, S. P. (1964), *Geology of the Ellsworth quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-333, scale 1:24,000.
- Berryhill, H. L., Jr., Schweinfurth, S. P., and Kent, B. H. (1971), *Coal-bearing Upper Pennsylvanian and Lower Permian rocks, Washington area, Pennsylvania—Part 1, Lithofacies; Part 2, Economic and engineering geology*, U.S. Geological Survey Professional Paper 621, 47 p.
- Berryhill, H. L., Jr., and Swanson, V. E. (1962), *Revised stratigraphic nomenclature for Upper Pennsylvanian and Lower Permian rocks, Washington County, Pennsylvania*, in *Geological Survey research 1962*, U.S. Geological Survey Professional Paper 450-C, p. C43-C46.
- _____. (1964), *Geology of the Washington West quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-283, scale 1:24,000.
- Campbell, M. R. (1903), *Brownsville-Connellsville folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 94, 19 p.
- Clapp, F. G. (1907), *Amity folio*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 144, 15 p.
- _____. (1907), *Economic geology of the Amity quadrangle, eastern Washington County, Pennsylvania*, U.S. Geological Survey Bulletin 300, 145 p.
- _____. (1907), *Rogersville folio*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 146, 14 p.
- Cortis, S. E., Alexander, T. B., Edmunds, W. E., and Craft, J. L. (1975), *Greater Pittsburgh Region maps of mined-out areas and thickness of rock over the Pittsburgh coal*, Pennsylvania Geological Survey, 4th ser., Map 45, scale 1:125,000, 2 sheets.
- Craft, J. L., Heyman, L., and Piotrowski, R. G. (1976), *Greater Pittsburgh Region thickness of rock over the Upper Freeport coal*, Pennsylvania Geological Survey, 4th ser., Map 49, scale 1:125,000.
- Diamond, W. P., McCulloch, C. M., and Bench, B. M. (1976), *Use of surface joint and photolinear data for predicting sub-surface coal cleat orientation*, U.S. Bureau of Mines Report of Investigations 8120, 13 p.
- Edmunds, W. E. (1972), *Coal reserves of Pennsylvania: total, recoverable, and strippable (January 1, 1970)*, Pennsylvania Geological Survey, 4th ser., Information Circular 72, 40 p.
- Ellenberger, J. L. (1979), *Slickenside occurrence in coal mine roof of the Valley Camp No. 3 mine near Wheeling, W. Va.*, U.S. Bureau of Mines Report of Investigations 8365, 17 p.
- Gray, T. E., and Palowitch, E. R. (1959), *Preparation characteristics of coal from Washington County, Pennsylvania*, U.S. Bureau of Mines Report of Investigations 5475, 26 p.
- Johnson, M. E. (1929), *Pittsburgh quadrangle—Geology and mineral resources*, Pennsylvania Geological Survey, 4th ser., Atlas 27, 236 p.
- Kent, B. H. (1967), *Geologic map of the Hackett quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-630, scale 1:24,000.
- _____. (1969), *Geologic map of part of the Carmichaels quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-588, scale 1:24,000.

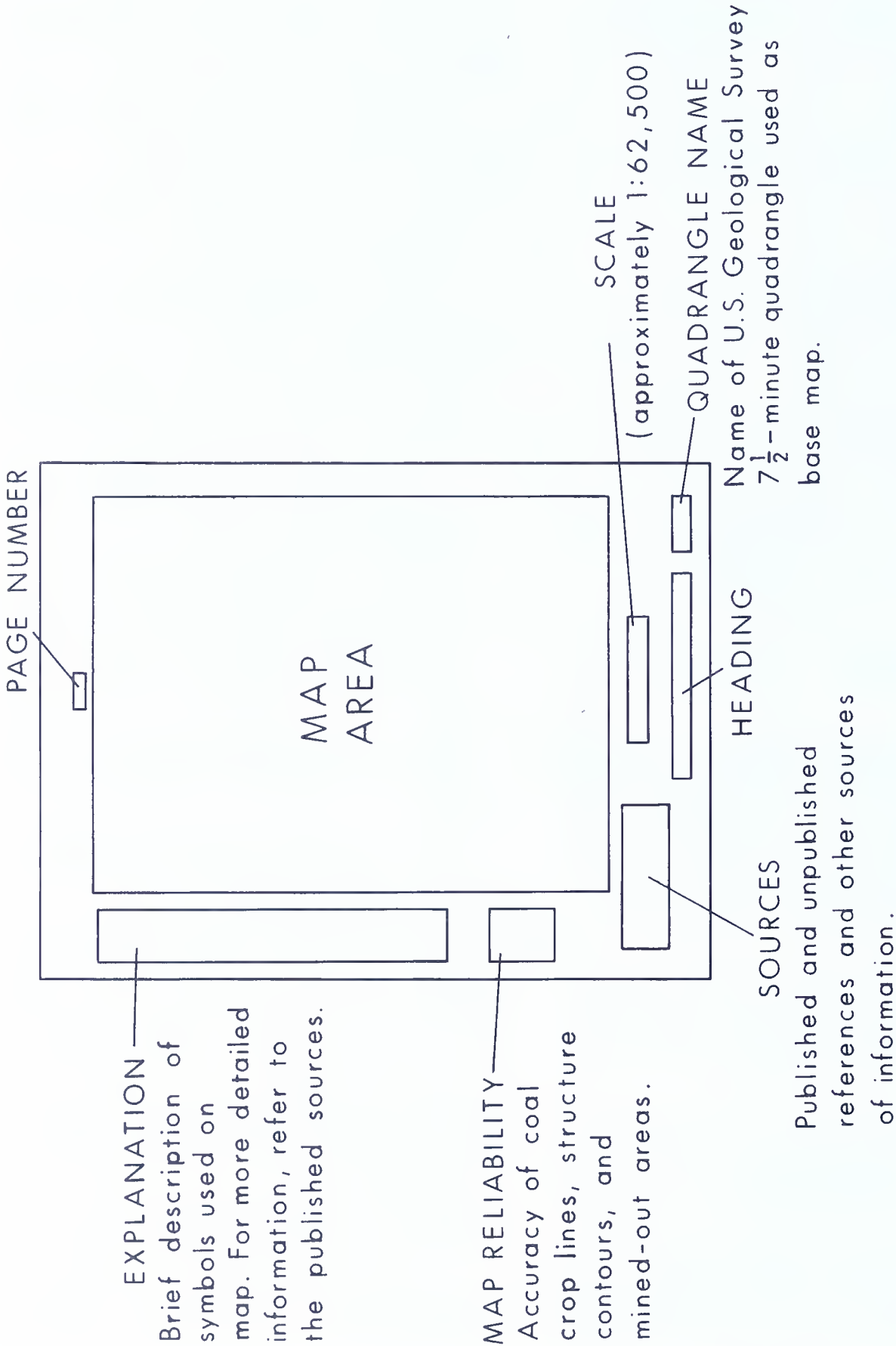


Figure 3. Guide to layout of compilation maps.

- Kent, B. H. (1969), *Geologic map of the Mather quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-826, scale 1:24,000.
- (1972), *Geologic map of the Prosperity quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-1003, scale 1:24,000.
- Kim, A. G. (1974), *Methane in the Pittsburgh coalbed, Washington County, Pa.*, U.S. Bureau of Mines Report of Investigations 7969, 16 p.
- McCulloch, C. M., Deul, M., and Jeran, P. W. (1974), *Cleat in bituminous coalbeds*, U.S. Bureau of Mines Report of Investigations 7910, 25 p.
- McCulloch, C. M., Diamond, W. P., Bench, B. M., and Deul, M. (1975), *Selected geologic factors affecting mining of the Pittsburgh coalbed*, U.S. Bureau of Mines Report of Investigations 8093, 72 p.
- McCulloch, C. M., Jeran, P. W., and Sullivan, C. D. (1975), *Geologic investigations of underground coal mining problems*, U.S. Bureau of Mines Report of Investigations 8022, 30 p.
- Moebis, N. N. (1981), *The geologic character of some coal wants at the Westland mine in southwestern Pennsylvania*, U.S. Bureau of Mines Report of Investigations 8555, 25 p.
- Munn, M. J. (1912), *Claysville folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 180, 14 p.
- Roen, J. B. (1970), *Geologic map of the Waynesburg quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-838, scale 1:24,000.
- (1973), *Geologic map of the Midway quadrangle, Washington County, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-1067, scale 1:24,000.
- Roen, J. B., and Farrel, D. E. (1980), *Structure contour map of the base of the Pittsburgh coal bed, southwestern Pennsylvania and northern West Virginia*, U.S. Geological Survey Coal Investigations Map C-88, scale 1:125,000.
- Roen, J. B., Kent, B. H., and Schweinfurth, S. P. (1968), *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000.
- Schweinfurth, S. P. (1967), *Geologic map of the California quadrangle, Washington and Fayette Counties, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-648, scale 1:24,000.
- (1975), *Geologic map of the West Middletown quadrangle, and part of the Bethany quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-871, scale 1:24,000.
- (1976), *Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000.
- Shaw, E. W., and Munn, M. J. (1911), *Burgettstown-Carnegie folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 177, 16 p.
- Sholes, M. A., and Skema, V. W., compilers (1974), *Bituminous coal resources in western Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 68, scale 1:250,000, 13 pls.
- Sisler, J. D. (1926), *Bituminous coal fields of Pennsylvania—Part II, Detailed description of coal fields*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 6, Pt. 2, 511 p.
- Skema, V. W., Berg, T. M., Bragonier, W. A., and others (1975), *Analyses and measured sections of Pennsylvania bituminous coals, Part II*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 69, 306 p.
- Skema, V. W., Edmunds, W. E., Glover, A. D., and others (1977), *Analyses and measured sections of Pennsylvania bituminous coals, Part III*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 74, 272 p.
- Skema, V. W., Sholes, M. A., and Edmunds, W. E. (1982), *The economic geology of the Upper Freeport coal in northeastern Greene County, Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 76, 51 p.
- Socolow, A. A., Berg, T. M., Glover, A. D., and others (1980), *Coal resources of Pennsylvania*, Pennsylvania Geological Survey, 4th ser., Information Circular 88, 49 p.
- Sponseller, R. D. (1973), *Analyses and measured sections of Pennsylvania bituminous coals*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 66 [479 p.].
- Stone, R. W. (1905), *Waynesburg folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 121, 12 p.
- Swanson, V. E., and Berryhill, H. L., Jr. (1964), *Geology of the Washington East quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-334, scale 1:24,000.
- U.S. Bureau of Mines (1928), *Bituminous coal fields of Pennsylvania—Part IV, Coal analyses*, 2nd ed., Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 6, Pt. 4, 268 p.
- Wagner, W. R., Craft, J. L., Heyman, L., and Harper, J. A. (1975), *Greater Pittsburgh Region geologic map and cross sections*, Pennsylvania Geological Survey, 4th ser., Map 42, scale 1:125,000, 6 pls.
- Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.
- Wallace, J. J., Dowd, J. J., Provost, J. M., and others (1955), *Estimate of known recoverable reserves of coking coal in Washington County, Pa.*, U.S. Bureau of Mines Report of Investigations 5109, 23 p.
- Wolfson, D. E., and Ortuglio, C. (1968), *Carbonizing properties of coals from Fayette, Greene and Washington Counties, Pa.*, U.S. Bureau of Mines Report of Investigations 7131, 14 p.

Extent of known
deep mining

limits of known deep-sea mining—approximately 100,000 years.

Limits of deep mining modified by V. W. Skema from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



Diagram illustrating the relationship between Magnetic North (MN) and True North (TN) with magnetic declination. The diagram shows a vertical line for True North (TN) and a slightly rotated line for Magnetic North (MN). The angle between them is labeled 'MAGNETIC DECLINATION'. Below the lines, it says '89 M.C.S.' and '74 M.C.S.'.

CONTOUR INTERVAL 20 FEET
DATUM: C. MEAN SEA. (C-2)

MINED-OUT AREAS OF THE PITTSBURGH COAL

ROAD CLASSIFICATION

_____ Light duty _____
_____ Unimproved dirt _____

Route  U.S. Route  State Route

AMITY

EXPLANATION

Crop line of the
Waynesburg coal

MAP RELIABILITY
Coal crop line—very
good

SOURCE

Crop line from Berryhill, H. L., Jr. (1964). *Geology of the Amity quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-296, scale 1:24,000.

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UTM GRID AND 1960 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



CONTOUR INTERVAL 20 FEET
DATUM: MEAN SEA LEVEL



AMITY

CROP LINE OF THE
WAYNESBURG COAL

EXPLANATION

CROP LINES

- W— Washington coal
- wbA— Waynesburg "A" coal
- wb— Waynesburg coal

- Anticline
Showing axial-plane trace and direction of plunge.

- Syncline
Showing axial-plane trace and direction of plunge.

- 500— Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

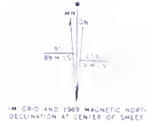
MAP RELIABILITY

- Coal crop lines—very good
- Structure contours—very good



SOURCES

Crop lines from Berryhill, H. L., Jr. (1964). *Geology of the Amity quadrangle, Pennsylvania*. U.S. Geological Survey Geologic Quadrangle Map GQ-296, scale 1:24 000.
Structure contours modified by V. W. Skema from Berryhill, H. L., Jr., Schweinfurth, S. P., and Kent, B. H. (1971). *Coal-bearing Upper Pennsylvanian and Lower Permian rocks, Washington area, Pennsylvania—Part 1, Lithofacies; Part 2, Economic and engineering geology*. U.S. Geological Survey Professional Paper 621, Plate 2



CONTOUR INTERVAL 20 FEET
DATUM: MEAN SEA LEVEL

WAYNESBURG SYNCLINE

- ROAD CLASSIFICATION
- Heavy-duty ——— Light-duty ———
 - Medium-duty ——— Unimproved dirt ———
 - Interstate Route — U.S. Route — State Route —

AMITY

COAL CROP LINES AND STRUCTURE CONTOURS



EXPLANATION

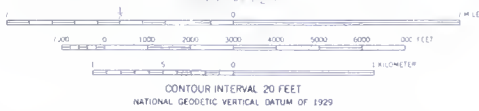
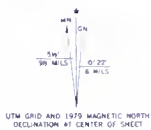
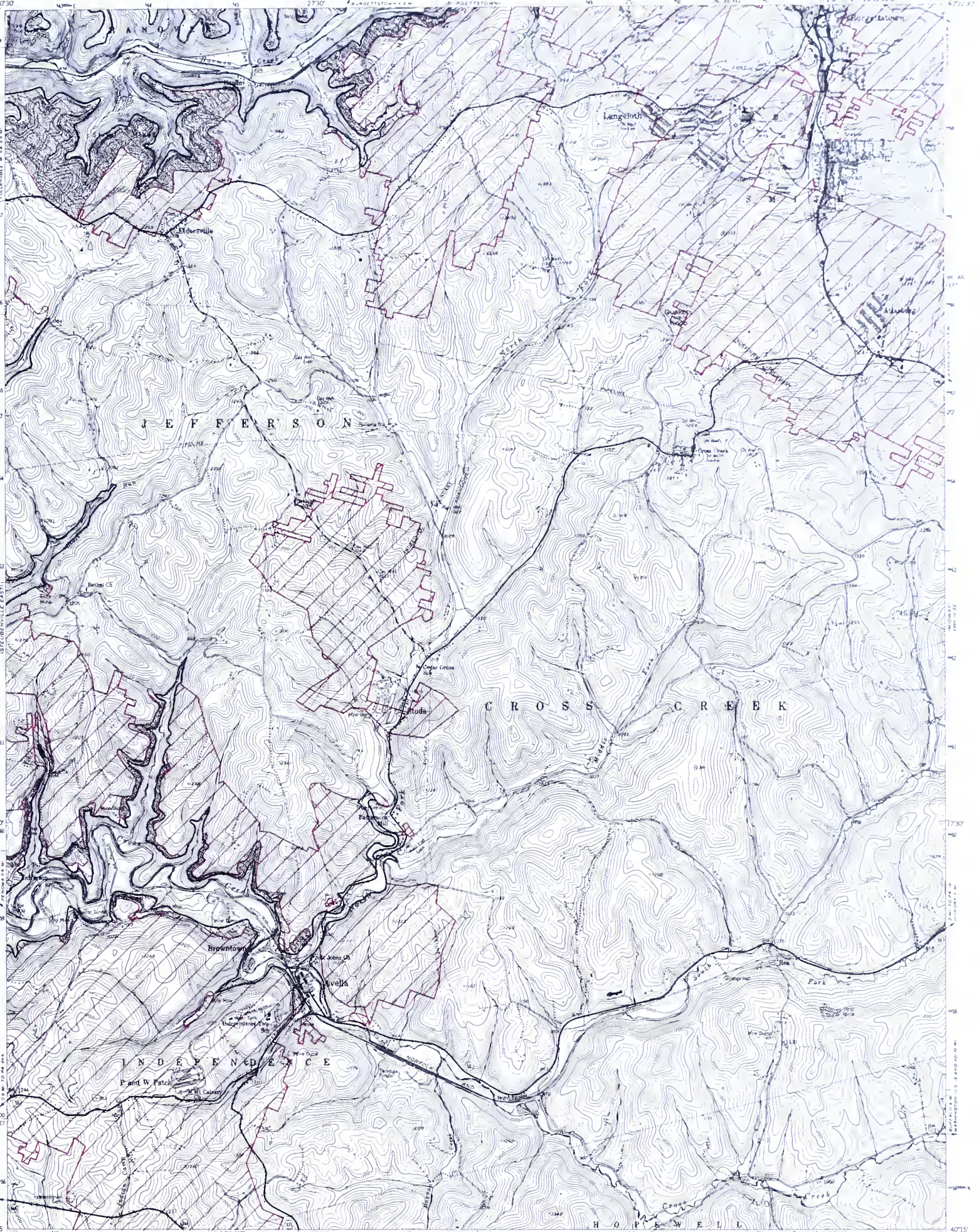
- Crop line of the Pittsburgh coal
- Extent of known strip mining
- Extent of known deep mining

MAP RELIABILITY

- Coal crop line—very good
- Limits of known strip mining—approximate
- Limits of known deep mining—approximate

SOURCES

Crop line slightly modified by V. W. Skema from Schweinfurth, S. P. (1976), *Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000. Limits of strip mining from Schweinfurth (1976) and interpretation of topographic map and aerial photographs. Limits of deep mining modified by V. W. Skema from unpublished mine maps, including Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



ROAD CLASSIFICATION	
Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
	State Route

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

AVELLA



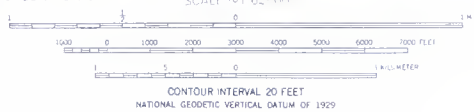
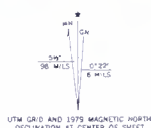
EXPLANATION

Crop line of the
Waynesburg coal

MAP RELIABILITY
Coal crop line—very
good

SOURCE

Crop line from Schweinfurth, S. P. (1976), *Geologic map of the Avelia quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000.



ROAD CLASSIFICATION
Heavy-duty ——— Light-duty ———
Medium-duty ——— Unimproved dirt ———
○ State Route



AVELLA

CROP LINE OF THE
WAYNESBURG COAL



EXPLANATION

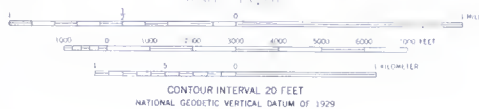
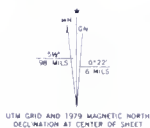
Crop line of the
Washington coal

Extent of known
strip mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate

SOURCES

Crop line from Schwenfurth, S. P. (1976). *Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map.



ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
State Route



CROP LINE AND MINED OUT AREAS OF THE
WASHINGTON COAL

AVELLA



EXPLANATION

CROP LINES

- W —
Washington coal
- wbA —
Waynesburg "A" coal
- wb —
Waynesburg coal
- p —
Pittsburgh coal

- Syncline
Showing axial-plane trace
and direction of plunge

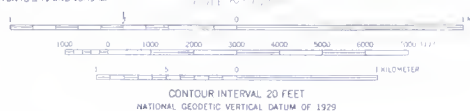
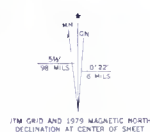
- 900 —
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

- MAP RELIABILITY
Coal crop lines—very
good
Structure contours—
very good



SOURCE

Crop lines slightly modified by V. W. Skema from Schweinfurth, S. P. (1976). *Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000. Structure contours from Schweinfurth (1976).



AVELLA

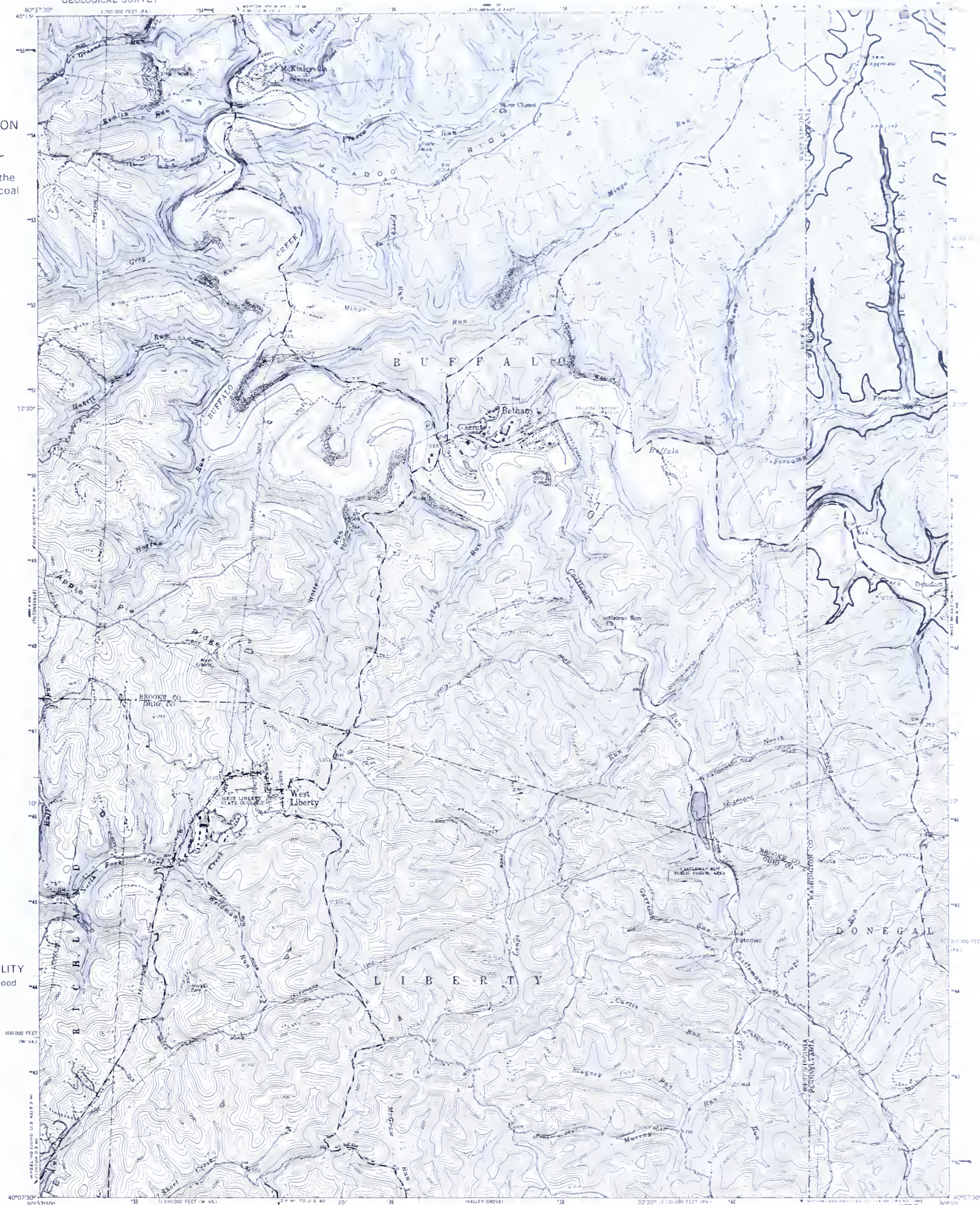
COAL CROP LINES AND STRUCTURE CONTOURS

EXPLANATION

Crop line of the
Waynesburg coal

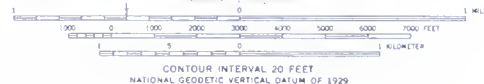
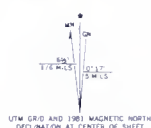
MAP RELIABILITY

Coal crop line—good



SOURCE

Crop line from Schweinfurth, S. P. (1975), *Geologic map of the West Middletown quadrangle, and part of the Bethany quadrangle, Washington County, Pennsylvania*. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-871, scale 1:24,000.



ROAD CLASSIFICATION
Medium-duty ——— Light-duty ———
Unimproved dirt ——— State Route —○—



BETHANY

CROP LINE OF THE
WAYNESBURG COAL

EXPLANATION

CROP LINES

—W—
Washington coal

—wbA—
Waynesburg "A" coal

—wb—
Waynesburg coal

—X—
Syncline
Showing axial-plane trace
and direction of plunge.

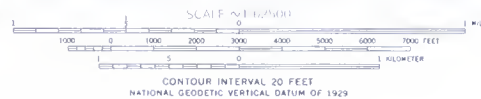
—700—
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Coal crop lines—good
Structure contours—good



SOURCE

Crop lines from Schweinfurth, S. P. (1975). *Geologic map of the West Middletown quadrangle, and part of the Bethany quadrangle, Washington County, Pennsylvania*. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-871, scale 1:24,000.
Structure contours modified by V. W. Skema from Schweinfurth (1975).






ROAD CLASSIFICATION
Medium duty ——— Light duty ———
Unimproved dirt ———
State Route ———

BETHANY

COAL CROP LINES AND STRUCTURE CONTOURS



EXPLANATION

-  Crop line of the Pittsburgh coal
-  Extent of known strip mining
-  Extent of known deep mining

MAP RELIABILITY

- Coal crop line—very good
- Limits of known strip mining—approximate
- Limits of known deep mining—approximate



SOURCES

Crop line by V. W. Skema based on structure contours compiled from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Red line indicates areas in which only landmark buildings are shown



ROAD CLASSIFICATION

Mainline Light Duty

Minor Unimproved 5th

U.S. Route State Route

CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL

BRIDGEVILLE



EXPLANATION

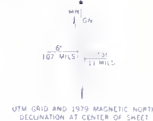
- Crop line of the Redstone coal
- Limit of Redstone coal deposition
- Extent of known strip mining

- MAP RELIABILITY
Coal crop line—very good
Limits of known strip mining—approximate



SOURCES

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal compiled from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000. Limits of strip mining based on interpretation of topographic map.



CROP LINE AND MINED-OUT AREAS OF THE REDSTONE COAL

BRIDGEVILLE



EXPLANATION

- Crop line of the Waynesburg coal
- Extent of known strip mining

MAP RELIABILITY
Coal crop line—very good
Limits of known strip mining—approximate

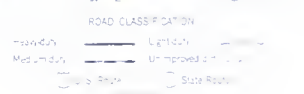
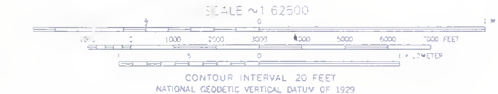


SOURCES

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal compiled from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000. Limits of strip mining based on interpretation of topographic map.



UTM GRID AND 1973 MAGNETIC NORTH
COLOCATION AT CENTER OF SHEET
5d line indicates areas in which only landmark
alignments are shown



CROP LINE AND MINED-OUT AREAS OF THE WAYNESBURG COAL

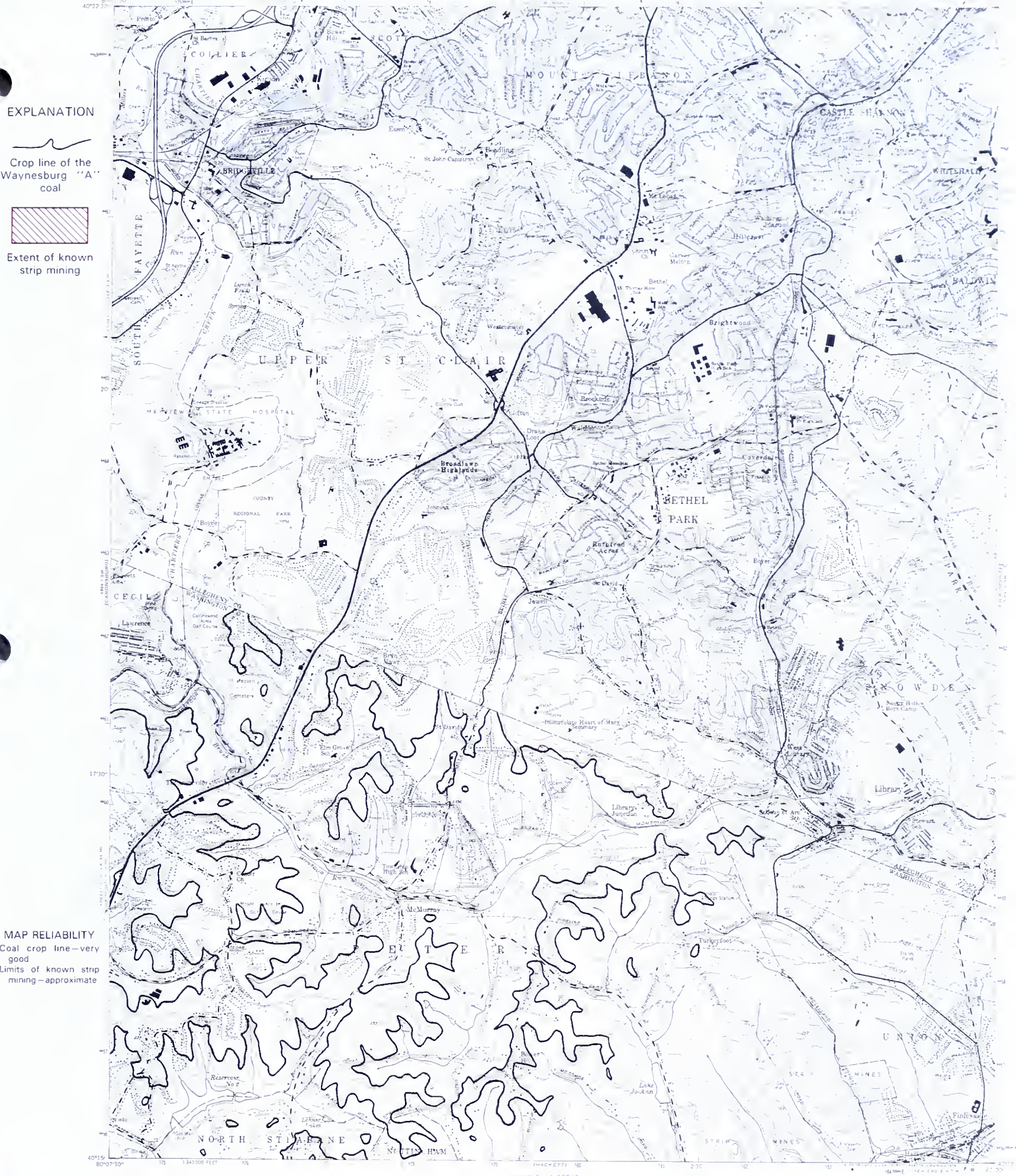
BRIDGEVILLE

EXPLANATION

Crop line of the
Waynesburg "A"
coal

Extent of known
strip mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate



SOURCES

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal compiled from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), Greater Pittsburgh Region structure contour map, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000. Limits of strip mining based on interpretation of topographic map.

1/4" = 1 MILE
1/4" = 1 MILE
1/4" = 1 MILE

CROP LINE AND MINED-OUT AREA OF THE
WAYNESBURG "A" COAL

BRIDGEVILLE

EXPLANATION

CROP LINES

- Washington coal
- Waynesburg "A" coal
- Waynesburg coal
- Redstone coal
- Pittsburgh coal

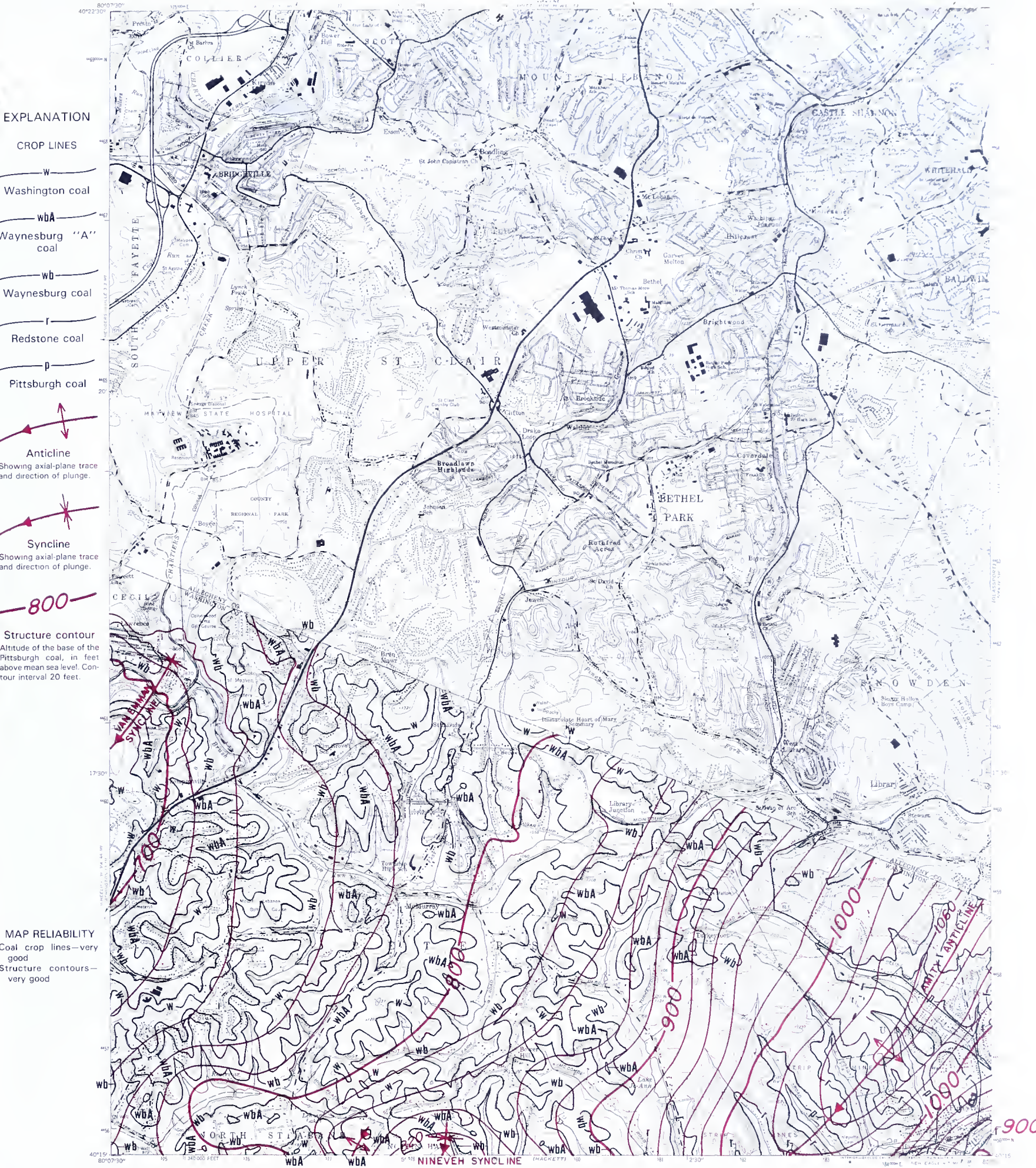
- Anticline
Showing axial-plane trace and direction of plunge.
- Syncline
Showing axial-plane trace and direction of plunge.

- Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

- MAP RELIABILITY
Coal crop lines—very good
Structure contours—very good

SOURCES

Crop lines by V. W. Skema based on structure contours and intervals from structure contours.
Structure contours compiled by V. W. Skema from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.






COAL CROP LINES AND STRUCTURE CONTOURS

BRIDGEVILLE



EXPLANATION

-  Crop line of the Pittsburgh coal
-  Extent of known strip mining
-  Extent of known deep mining

MAP RELIABILITY

- Coal crop line—very good
- Limits of known strip mining—approximate
- Limits of known deep mining—approximate

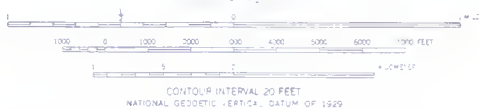
SOURCES

Crop line by V. W. Skema based on structure contours compiled from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.

Limits of strip mining based on interpretation of topographic map and aerial photographs.

Limits of deep mining from unpublished mine maps, including Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION

- Heavy-duty
- Medium-duty
- Light-duty
- Unimproved dirt
- S. Route
- State Route

BURGETTSTOWN

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL



EXPLANATION

—P—
Crop line of the
Pittsburgh coal

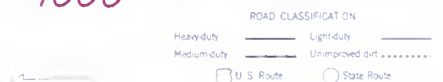
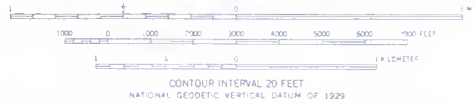
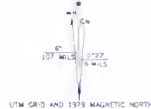
—X—
Syncline
Showing axial-plane trace
and direction of plunge

—1200—
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

MAP RELIABILITY
Coal crop line—very
good
Structure contours—
very good

SOURCES

Crop line by V. W. Skema based on structure contours.
Structure contours compiled by V. W. Skema from unpublished
data and Wagner, W. R., Heyman, L., Craft, J. L., and others
(1975), *Greater Pittsburgh Region structure contour map*, Penn-
sylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.



BURGETTSTOWN

COAL CROP LINE AND
STRUCTURE CONTOURS



EXPLANATION

- Crop line of the Pittsburgh coal
- Extent of known strip mining
- Extent of known deep mining

MAP RELIABILITY

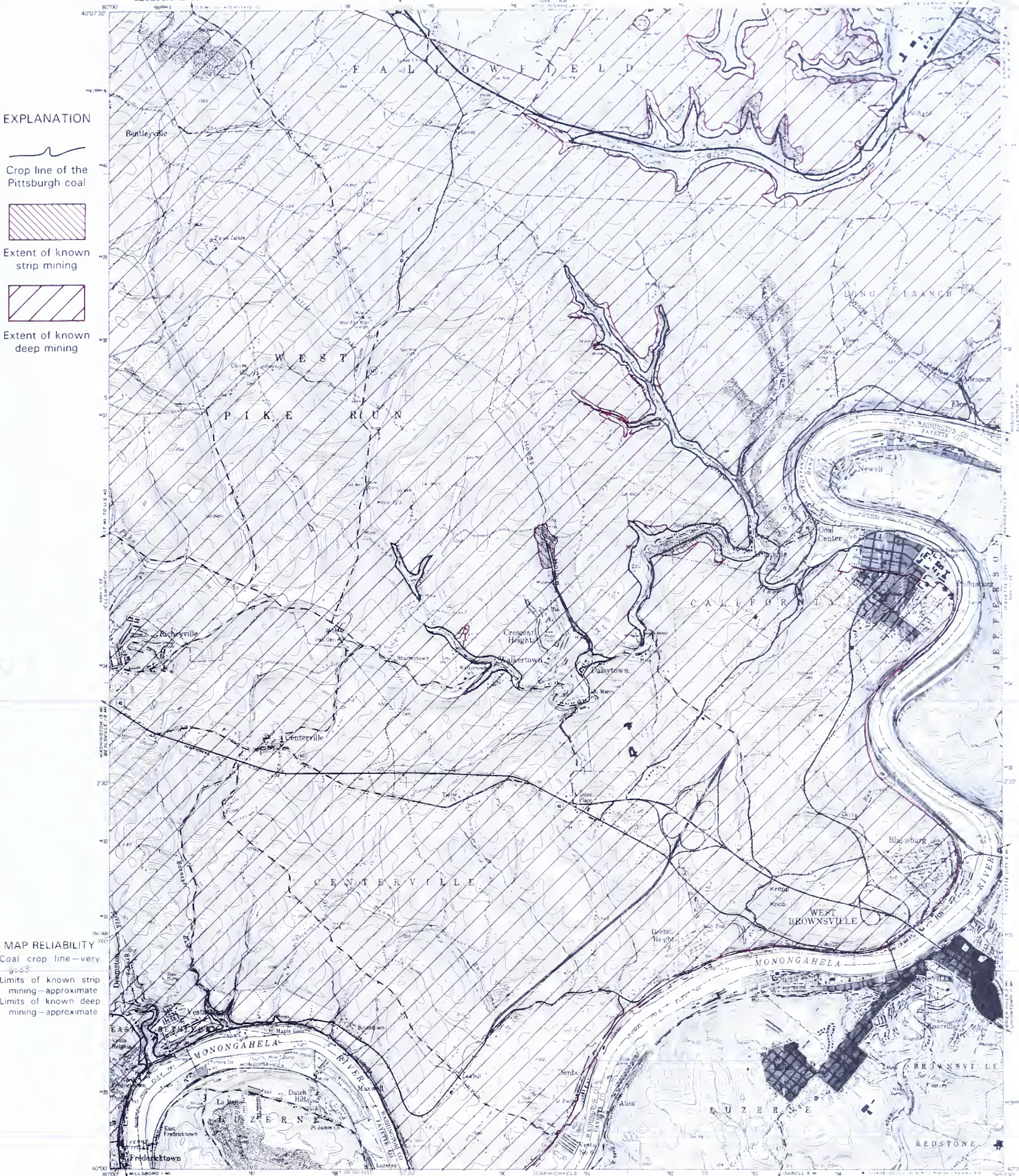
- Coal crop line—very good
- Limits of known strip mining—approximate
- Limits of known deep mining—approximate

SOURCES

Crop line modified by V. W. Skema from Schweinfurth, S. P. (1967). *Geologic map of the California quadrangle, Washington and Fayette Counties, Pennsylvania*. U.S. Geological Survey Geologic Quadrangle Map GQ-648, scale 1:24,000.

Limits of strip mining from Schweinfurth (1967) and interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978). unpublished map.



UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



CALIFORNIA

CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL



EXPLANATION

Crop line of the
Redstone coal

Limit of Redstone
coal deposition



Extent of known
strip mining

MAP RELIABILITY

Coal crop line—very
good

Limits of known strip
mining—approximate

SOURCES

Crop line modified by V. W. Skema from Schweinfurth, S. P. (1967). *Geologic map of the California quadrangle, Washington and Fayette Counties, Pennsylvania*. U.S. Geological Survey Geologic Quadrangle Map GQ-648, scale 1:24,000.

Limits of strip mining from Schweinfurth (1967), interpretation of topographic map, and field checking

UTM GRID AND 1979 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 20 FEET
NATIONAL GEODESIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy-duty ——— Light-duty ———
Medium-duty - - - - - Interrupted dirt - - - - -
State Route ———

STATE ROUTE

CROP LINE AND MINED-OUT AREAS OF THE
REDSTONE COAL

CALIFORNIA



EXPLANATION

Crop line of the
Waynesburg coal

Extent of known
strip mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate

SOURCES

Crop line from Schweinfurth, S. P. (1967), *Geologic map of the California quadrangle, Washington and Fayette Counties, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GO-648, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map and aerial photographs.

UTM GRID AND 1970 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy duty
Medium duty
U.S. Route
State Route



PENNSYLVANIA
QUADRANGLE LOCATION

CALIFORNIA

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG COAL



EXPLANATION

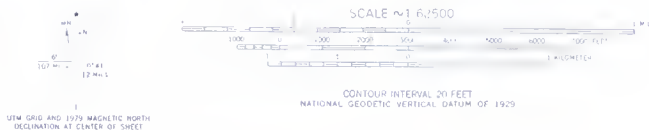
-  Crop line of the Waynesburg "A" coal
-  Extent of known strip mining

- MAP RELIABILITY
- Coal crop line—very good
 - Limits of known strip mining—approximate



SOURCES

Crop line from Schweinfurth, S. P. (1967), *Geologic map of the California quadrangle, Washington and Fayette Counties, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-648, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map and aerial photographs.



CALIFORNIA

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG "A" COAL

EXPLANATION

CROP LINES

- W— Washington coal
- wbA— Waynesburg "A" coal
- wb— Waynesburg coal
- r— Redstone coal
- p— Pittsburgh coal

Anticline
Showing axial-plane trace
and direction of plunge.

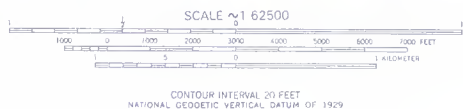
Syncline
Showing axial-plane trace
and direction of plunge.

Structure contour
Elevation of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Coal crop lines—very
good
Structure contours—
very good

SOURCE

Crop lines and structure contours slightly modified by V. W. Skema from Schweinfurth, S. P. (1967), *Geologic map of the California quadrangle, Washington and Fayette Counties, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-648, scale 1:24,000.



CALIFORNIA

COAL CROP LINES AND STRUCTURE CONTOURS



EXPLANATION

-  Crop line of the Pittsburgh coal
-  Extent of known strip mining
-  Extent of known deep mining

MAP RELIABILITY

- Coal crop line—very good
- Limits of known strip mining—approximate
- Limits of known deep mining—approximate

SOURCES

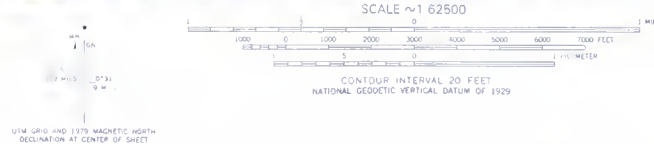
Crop line by V. W. Skema based on structure contours compiled from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.

Limits of strip mining based on interpretation of topographic map.

Limits of deep mining modified by V. W. Skema from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

CANONSBURG



ROAD CLASSIFICATION	
Heavy duty	Light duty
Medium duty	Unimproved dirt
U.S. Route	State Route
County Route	Local Road



EXPLANATION

- Crop line of the
Waynesburg coal
- Extent of known
strip mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate



SOURCES

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal compiled from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000. Limits of strip mining based on interpretation of topographic map.



- ROAD CLASSIFICATION
- Heavy-duty ——— Light-duty ———
- Medium-duty ——— Unimproved dirt ———
- U.S. Route State Route

CANONSBURG

CROP LINE AND MINED-OUT AREA OF THE
WAYNESBURG COAL



EXPLANATION

CROP LINES

- w —
Washington coal
- wba —
Waynesburg "A" coal
- wb —
Waynesburg coal
- p —
Pittsburgh coal

Anticline
Showing axial-plane trace
and direction of plunge.

Syncline
Showing axial-plane trace
and direction of plunge.

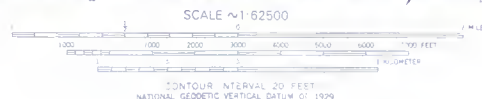
— 900 —
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Coal crop lines—very
good
Structure contours—
very good



SOURCES

Crop lines by V. W. Skema based on structure contours and intervals from structure contours.
Structure contours compiled by V. W. Skema from unpublished data and Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.



ROAD CLASSIFICATION
Main roads
Unimproved roads

CANONSBURG

COAL CROP LINES AND STRUCTURE CONTOURS



EXPLANATION

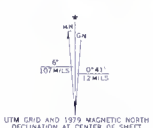
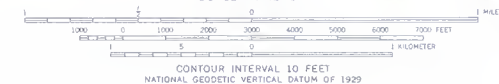
Crop line of the
Pittsburgh coal

Extent of known
deep mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known deep
mining—approximate

SOURCES

Crop line slightly modified by V. W. Skema from Kent, B. H. (1969). *Geologic map of part of the Carmichaels quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-588, scale 1:24,000.
Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



ROAD CLASSIFICATION
Heavy duty
Medium duty
Light duty
Unimproved dirt
State Route



CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL

CARMICHAELS



EXPLANATION

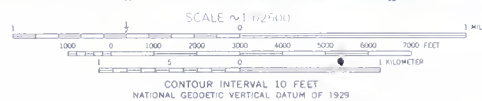
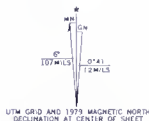
— p —
Crop line of the
Pittsburgh coal

— 800 —
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Coal crop line—very
good
Structure contours—
very good

SOURCE

Crop line and structure contours slightly modified by V. W. Skema from Kent, B. H. (1969), *Geologic map of part of the Carmichaels quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-588, scale 1:24,000.



ROAD CLASSIFICATION
Heavy duty ————
Medium duty ————
Light duty ————
Unimproved dirt ————
State Route ————



COAL CROP LINE AND STRUCTURE CONTOURS

CARMICHAELS

EXPLANATION



Extent of known
deep mining

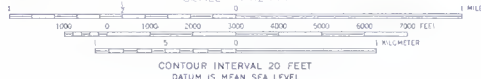
MAP RELIABILITY

Limits of known deep
mining—approximate

SOURCE

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

UTM GRID AND 1973 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



CLAYSVILLE

MINED-OUT AREAS OF THE
PITTSBURGH COAL

EXPLANATION

— W —
Crop line of the
Washington coal

Anticline
Showing axial-plane trace
and direction of plunge.

Syncline
Showing axial-plane trace
and direction of plunge.

— 500 —

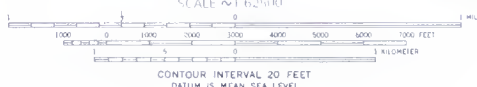
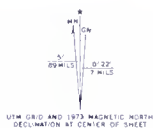
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Coal crop line—good
Structure contours—
good



SOURCES

Crop line modified by V. W. Skema from Munn, M. J. (1912), *Claysville folio*, Pennsylvania, U.S. Geological Survey Geologic Atlas of the U.S., Folio 180, 14 p.
Structure contours compiled by V. W. Skema from unpublished data and from Consolidation Coal Company (1981), unpublished map.



ROAD CLASSIFICATION

Heavy duty	Light duty
Medium duty	Unimproved dirt
Interstate Route	U.S. Route
	State Route



CLAYSVILLE

COAL CROP LINE AND
STRUCTURE CONTOURS



EXPLANATION

Crop line of the
Pittsburgh coal

Extent of known
strip mining

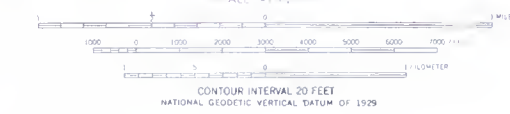
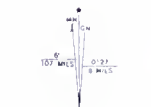
Extent of known
deep mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate
Limits of known deep
mining—approximate



SOURCES

Crop line by V. W. Skema based on structure contours from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975). *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000. Limits of strip mining based on interpretation of topographic map and aerial photographs. Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



CLINTON

CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL



EXPLANATION

—P—
Crop line of the
Pittsburgh coal

—X—
Syncline
Showing axial-plane trace
and direction of plunge

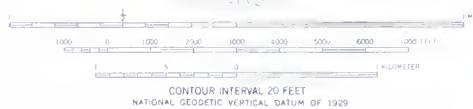
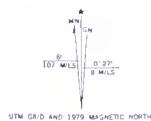
—1100—
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

MAP RELIABILITY
Coal crop line—very
good
Structure contours—
very good



SOURCE

Crop line by V. W. Skema based on structure contours
Structure contours from Wagner, W. R., Heyman, L., Craft,
J. L., and others (1975), *Greater Pittsburgh Region structure
contour map*, Pennsylvania Geological Survey, 4th ser., Map
43, scale 1:125,000.



ROAD CLASSIFICATION
Heavy duty ——— Light duty ———
Medium duty ——— Unimproved dirt ———
U.S. Route ——— State Route ———



CLINTON

COAL CROP LINE AND
STRUCTURE CONTOURS



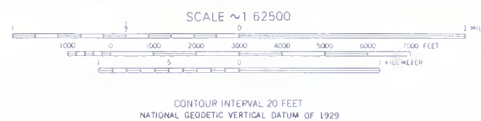
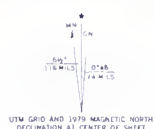
EXPLANATION

- Crop line of the Pittsburgh coal
- Extent of known strip mining
- Extent of known deep mining

- ## MAP RELIABILITY
- Coal crop line—very good
 - Limits of known strip mining—approximate
 - Limits of known deep mining—approximate

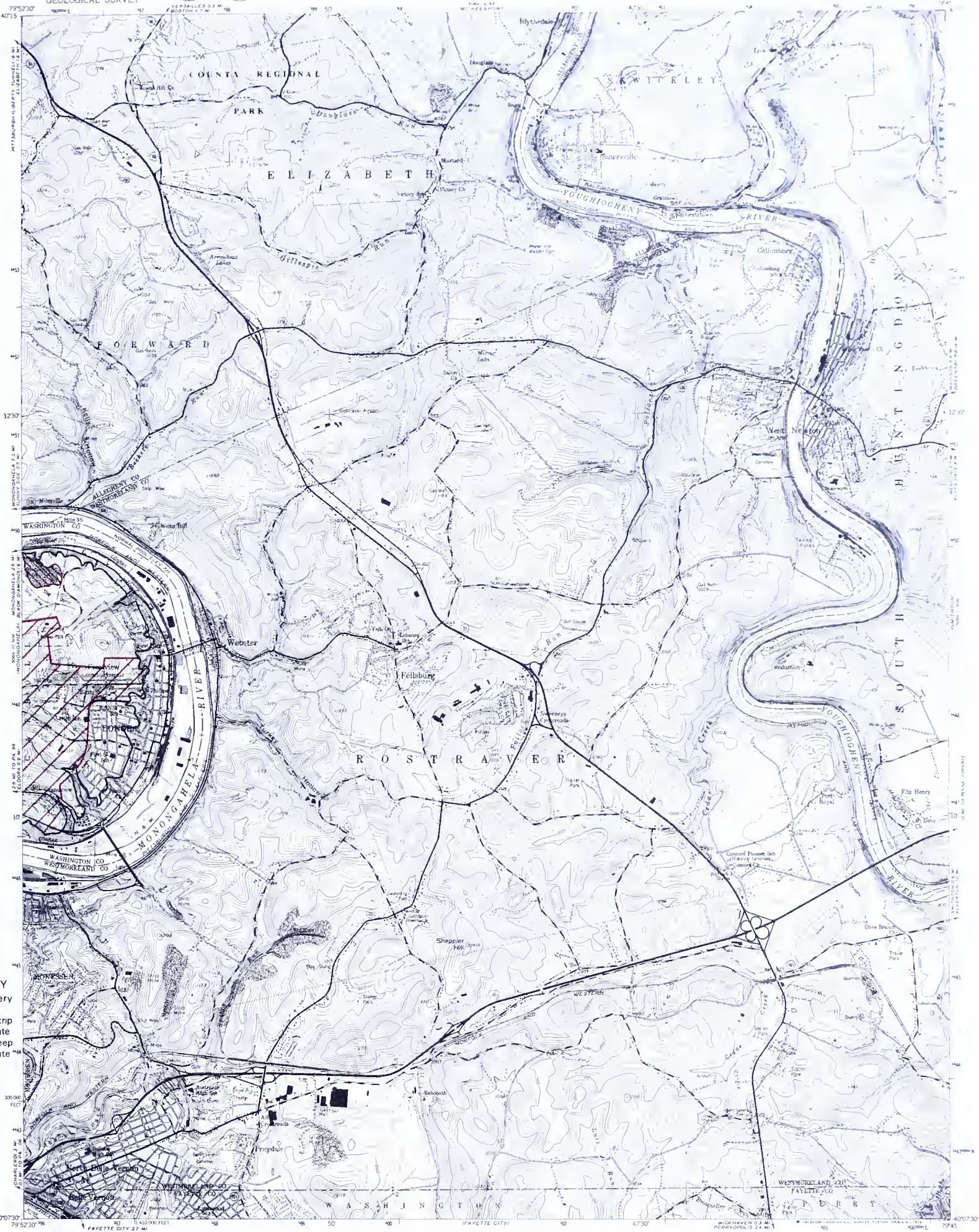
SOURCES

Crop line by V. W. Skema based on structure contours from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000. Limits of strip mining based on interpretation of topographic map. Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



DONORA

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL



Extent of known strip mining

This is a detailed topographic map of the Rostraver area in Washington County, West Virginia. The map is oriented with North at the top. The Monongahela River is a prominent feature, winding through the landscape from the bottom left towards the top right. The town of Rostraver is located in the center of the map, with several smaller settlements nearby, including Elizabeth, Forward, and Fellsburg. The map shows a network of roads and trails, as well as various geographical features such as hills, valleys, and water bodies. Contour lines are used to represent elevation, with labels indicating specific heights. A scale bar at the bottom of the map provides a reference for distances in both feet and miles. The map is titled "ROSTRAVER" in large, bold letters across the center.

DONORA

CROP LINE AND MINED-OUT AREAS OF THE REDSTONE COAL

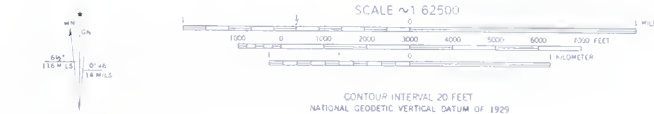
EXPLANATION


Crop line of the
Waynesburg coal



SOURCE

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975). *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.



DONORA

CROP LINE OF THE
WAYNESBURG COAL

EXPLANATION

CROP LINES

—wb—
Waynesburg coal

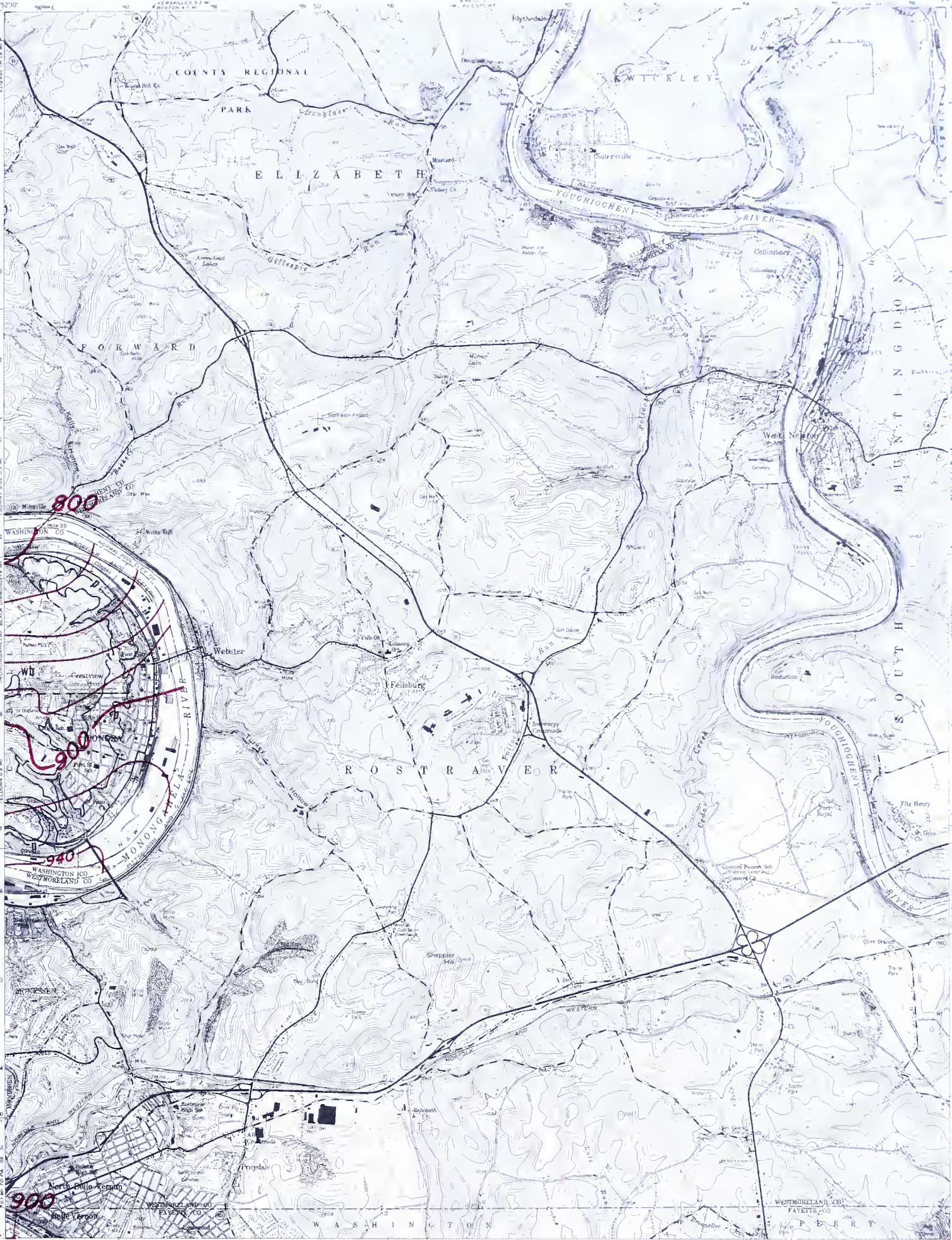
—r—
Redstone coal

—p—
Pittsburgh coal

—900—

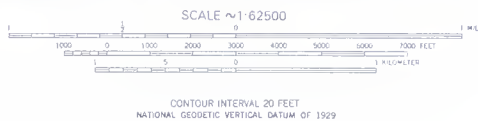
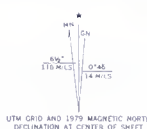
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Coal crop lines—very
good
Structure contours—
very good



SOURCE

Crop lines by V. W. Skema based on structure contours and intervals from structure contours.
Structure contours from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.

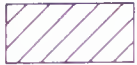


DONORA

COAL CROP LINES AND
STRUCTURE CONTOURS



EXPLANATION



Extent of known
deep mining

MAP RELIABILITY
Limits of known deep
mining—approximate

SOURCE

Limits of deep mining modified by V. W. Skema from Penn-
sylvania Department of Environmental Resources, Bureau of
Mining and Reclamation (1978), unpublished map.



UTM GRID AND 1979 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



ROAD CLASSIFICATION
Heavy-duty Medium-duty Light-duty Unimproved dirt
U.S. Route State Route

ELLSWORTH

MINED-OUT AREA OF THE
PITTSBURGH COAL



EXPLANATION

Crop line of the
Waynesburg coal



Extent of known
strip mining

MAP RELIABILITY

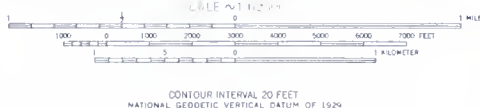
Coal crop line—very
good
Limits of known strip
mining—approximate



SOURCES

Crop line from Berryhill, H. L., Jr., and Schweinfurth, S. P., (1964), *Geology of the Ellsworth quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-333, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map and aerial photographs.

UTM GRID AND 1979 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



ROAD CLASSIFICATION
Heavy duty ——— Light duty ———
Medium duty ——— Unimproved dirt ———
U.S. Route ——— State Route ———

ELLSWORTH

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG COAL



EXPLANATION

- Crop line of the
Waynesburg "A"
coal
- Extent of known
strip mining

MAP RELIABILITY

- Coal crop line—very
good
- Limits of known strip
mining—approximate

SOURCES

Crop line from Berryhill, H. L., Jr., and Schweinfurth, S. P., 1964, *Geology of the Ellsworth quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-333, scale 1:24,000
Limits of strip mining based on interpretation of topographic map and aerial photographs.



CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG "A" COAL

ELLSWORTH



AMITY
ANTICLINE

EXPLANATION

CROP LINES

W

Washington coal

wbA

Waynesburg "A" coal

wb

Waynesburg coal



Anticline

Showing axial-plane trace and direction of plunge



Syncline

Showing axial-plane trace and direction of plunge

600

Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Coal crop lines—very
good
Structure contours—
very good

SOURCE

Crop lines and structure contours from Berryhill, H. L., Jr., and Schweinfurth, S. P. (1964), *Geology of the Ellsworth quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-333, scale 1:24,000.

1979 MAGNETIC NORTH
GEOLOGICAL CENTER OF SHEET



CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



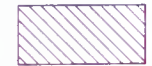
ELLSWORTH

COAL CROP LINES AND STRUCTURE CONTOURS



EXPLANATION

Crop line of the Pittsburgh coal



Extent of known strip mining



Extent of known deep mining

MAP RELIABILITY

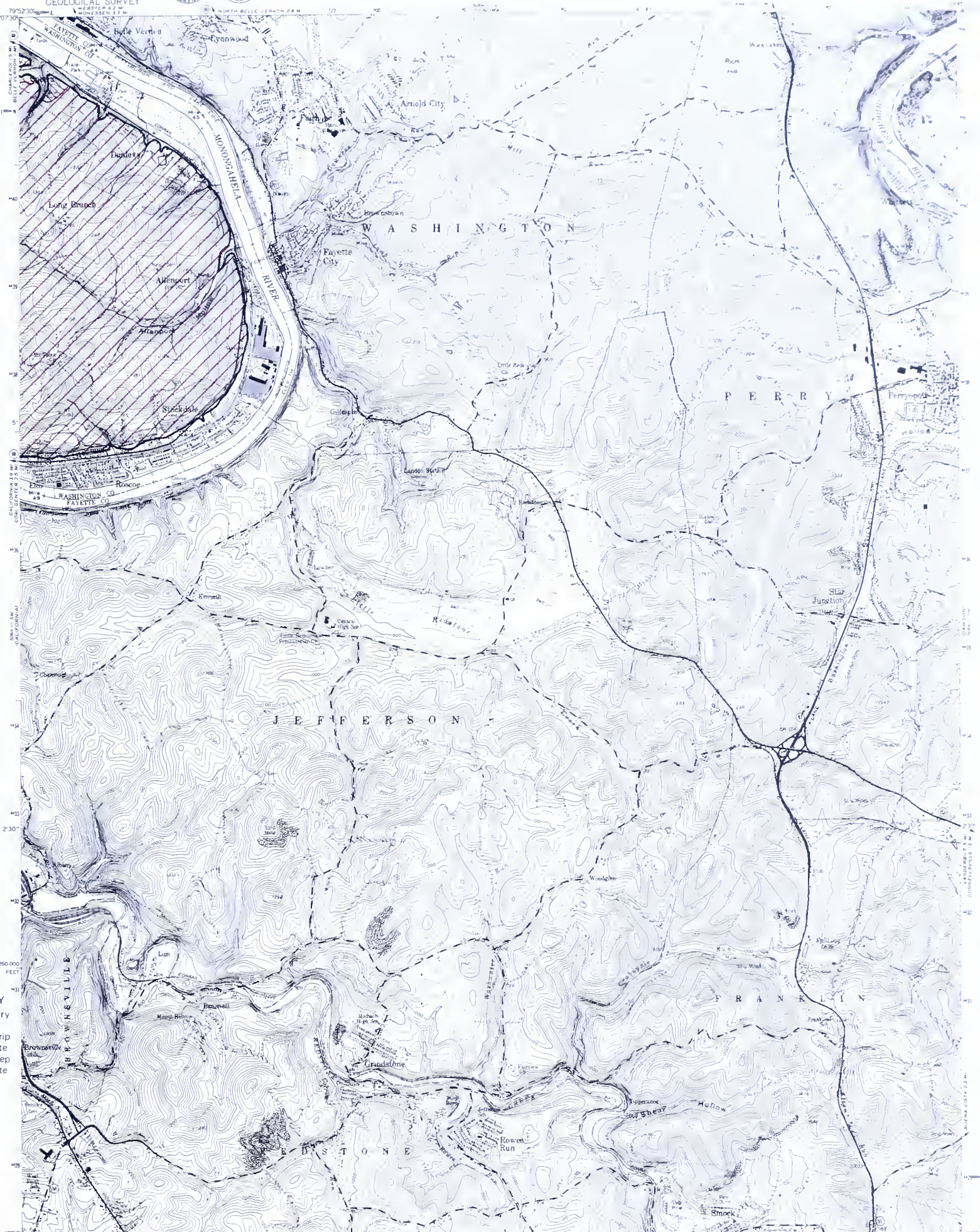
Coal crop line—very good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line by V. W. Skema based on structure contours from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000. Limits of strip mining based on interpretation of topographic map. Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

FAYETTE CITY



UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:125,000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy duty ——— Light duty ———
Medium duty ——— Unimproved dirt ———
U.S. Route —○— State Route —○—



EXPLANATION

Crop line of the
Redstone coal



Extent of known
strip mining

MAP RELIABILITY

Coal crop line—very
good

Limits of known strip
mining—approximate

SOURCES

Crop line by V. W. Skema based on interval from structure con-
tours on the Pittsburgh coal from Wagner, W. R., Heyman, L.,
Craft, J. L., and others (1975), *Greater Pittsburgh Region
structure contour map*, Pennsylvania Geological Survey, 4th
ser., Map 43, scale 1:125,000.
Limits of strip mining based on interpretation of topographic
map.

CROP LINE AND MINED-OUT AREA OF THE
REDSTONE COAL

FAYETTE CITY



SCALE 1:62500

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Heavy duty Medium duty Light duty
Improved dirt Road

PENNSYLVANIA

42°45' N. 79°52' W.

UTM GRID AND 1975 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

EXPLANATION

Crop line of the
Waynesburg coal

MAP RELIABILITY
Coal crop line—very
good

SOURCE

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.

UTM GRID AND 1979 MAGNETIC NORTH
RED. DATUM AT CENTER OF SHEET

CONTOUR INTERVAL 20 FEET
NATIONAL GEODESIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy duty
Medium duty
Light duty
Unimproved dirt
Route
State Route

PENNSYLVANIA
FAYETTE CITY

CROP LINE OF THE
WAYNESBURG COAL

EXPLANATION

CROP LINES

- wbA—
Waynesburg "A" coal
- wb—
Waynesburg coal
- r—
Redstone coal
- p—
Pittsburgh coal

- 
Syncline
Showing axial-plane trace and direction of plunge

- 800—
Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

- MAP RELIABILITY
Coal crop lines—very good
Structure contours—very good

SOURCE

Crop lines by V. W. Skema based on structure contours and intervals from structure contours.
Structure contours from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975). *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.

UTM GRID AND 1979 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy-duty ——— Light-duty ———
Medium-duty ——— Unimproved dirt ———
U.S. Route —○— State Route —○—

FAYETTE CITY

COAL CROP LINES AND STRUCTURE CONTOURS



EXPLANATION

- Crop line of the Pittsburgh coal
- Extent of known strip mining
- Extent of known deep mining

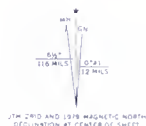
- MAP RELIABILITY
- Coal crop line—very good
 - Limits of known strip mining—approximate
 - Limits of known deep mining—approximate

SOURCES

Crop line by V. W. Skema based on structure contours compiled by extending contours from adjacent areas (Dodge, C. H., compiler (1985), *Coal resources of Allegheny County, Pennsylvania—Part 1, Coal crop lines, mined-out areas, and structure contours*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 89, Part 1, page 35; and Roen, J. B., Kent, B. H., and Schweinfurth, S. P. (1968), *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000).

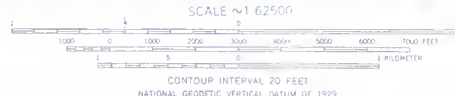
Limits of strip mining based on interpretation of topographic map.

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

GLASSPORT





EXPLANATION

- Crop line of the Redstone coal
- Extent of known strip mining

MAP RELIABILITY
Coal crop line—very good
Limits of known strip mining—approximate

SOURCES

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal compiled by extending contours from adjacent areas (Dodge, C. H., compiler (1985), *Coal resources of Allegheny County, Pennsylvania—Part 1, Coal crop lines, mined-out areas, and structure contours*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 89, Part 1, page 35; and Roen, J. B., Kent, B. H., and Schweinfurth, S. P. (1968), *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000).
Limits of strip mining based on interpretation of topographic map.

CROP LINE AND MINED-OUT AREAS OF THE
REDSTONE COAL

GLASSPORT



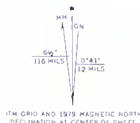
EXPLANATION

Crop line of the
Waynesburg coal

MAP RELIABILITY
Coal crop line—good

SOURCES

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal compiled by extending contours from adjacent areas (Dodge, C. H., compiler (1985), *Coal resources of Allegheny County, Pennsylvania—Part 1, Coal crop lines, mined-out areas, and structure contours*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 89, Part 1, page 35; and Roen, J. B., Kent, B. H., and Schweinfurth, J. P. (1968), *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000).



ROAD CLASSIFICATION

Heavily	Light duty
Medium-duty	Unimproved dirt
	State Route

GLASSPORT

CROP LINE OF THE
WAYNESBURG COAL





EXPLANATION

CROP LINES

wbA

Waynesburg "A" coal

wb

Waynesburg coal

r

Redstone coal

p

Pittsburgh coal

—900—

Structure contour

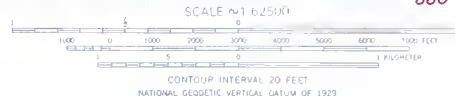
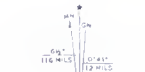
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

MAP RELIABILITY

Coal crop lines—good
Structure contours—good

SOURCES

Crop lines by V. W. Skema based on structure contours and intervals from structure contours.
Structure contours compiled by V. W. Skema based on extending contours from adjacent areas (Dodge, C. H., compiler (1985), *Coal resources of Allegheny County, Pennsylvania—Part 1, Coal crop lines, mined-out areas, and structure contours*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 89, Part 1, p. 35; and Roen, J. B., Kent, B. H., and Schweinfurth, S. P. (1968), *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000).



COAL CROP LINES AND STRUCTURE CONTOURS

GLASSPORT



EXPLANATION

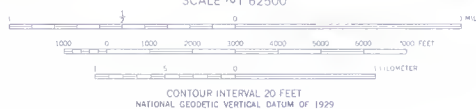
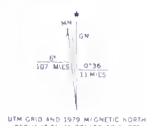
- Crop line of the Pittsburgh coal
- Extent of known strip mining
- Extent of known deep mining

MAP RELIABILITY
Coal crop line—very good
Limits of known strip mining—approximate
Limits of known deep mining—approximate



SOURCES

Crop line modified by V. W. Skema from Kent, B. H. (1967). *Geologic map of the Hackett quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-630, scale 1:24,000.
Limits of strip mining from Kent, B. H. (1967) and interpretation of topographic map.
Limits of deep mining modified by V. W. Skema from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

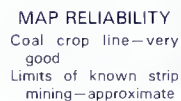


ROAD CLASSIFICATION
Heavy-duty ———— Light-duty ————
Medium-duty ———— Unimproved dirt ————
Interstate Route ———— State Route ————

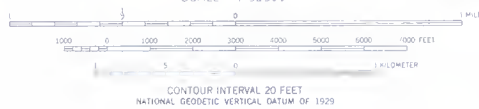


HACKETT

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL



Crop line modified by V. W. Skema from Kent, B. H. (1967). *Geologic map of the Hackett quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-630, scale 1:24,000. Limits of strip mining from Kent, B. H. (1967) and interpretation of topographic map.



ROAD CLASSIFICATION

Heavy-duty	—————	4 1 2 3 4 5 6 7 8 9 10	Light-duty	—————
Medium-duty	—————	4 1 2 3 4 5 6 7 8 9 10	Unimproved dirt
Interstate Route			State Route	



PENNSYLVANIA

QUADRANGLE LOCATION

HACKETT

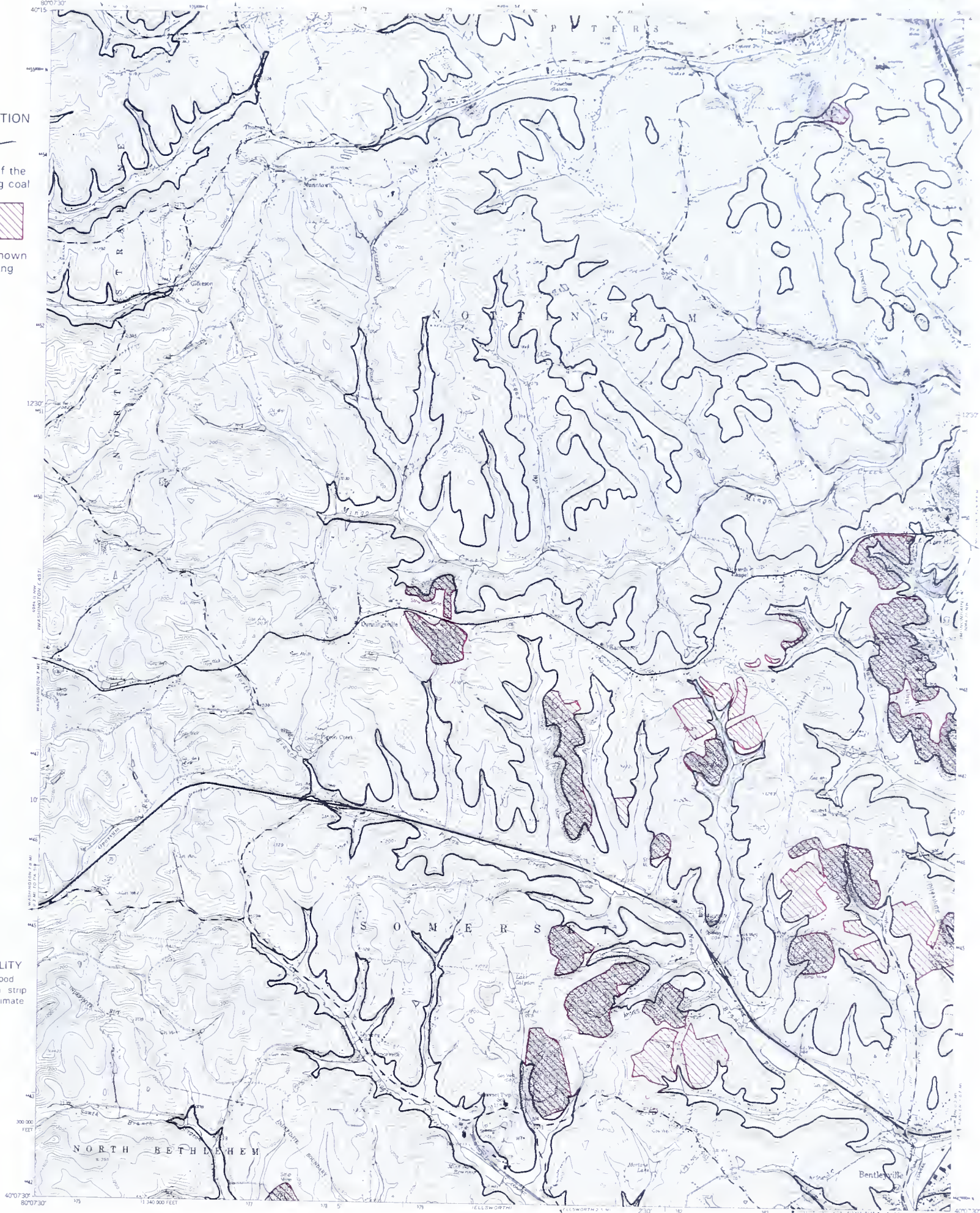
CROP LINE AND MINED-OUT AREAS OF THE REDSTONE COAL



EXPLANATION

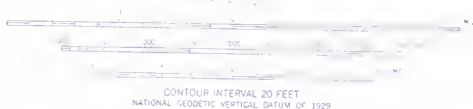
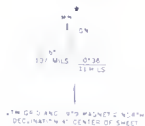
- Crop line of the Waynesburg coal
- Extent of known strip mining

MAP RELIABILITY
Coal crop line—good
Limits of known strip mining—approximate



SOURCES

Crop line from Kent, B. H. (1967). *Geologic map of the Hackett quadrangle, Washington County, Pennsylvania*. U.S. Geological Survey Geologic Quadrangle Map GQ-630, scale 1:24,000. Limits of strip mining based on interpretation of topographic map and aerial photographs.



ROAD CLASSIFICATION	
Heavy-duty	Light-duty
Med. med. duty	Unimproved
Trails	Wise Road

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG COAL

HACKETT



EXPLANATION

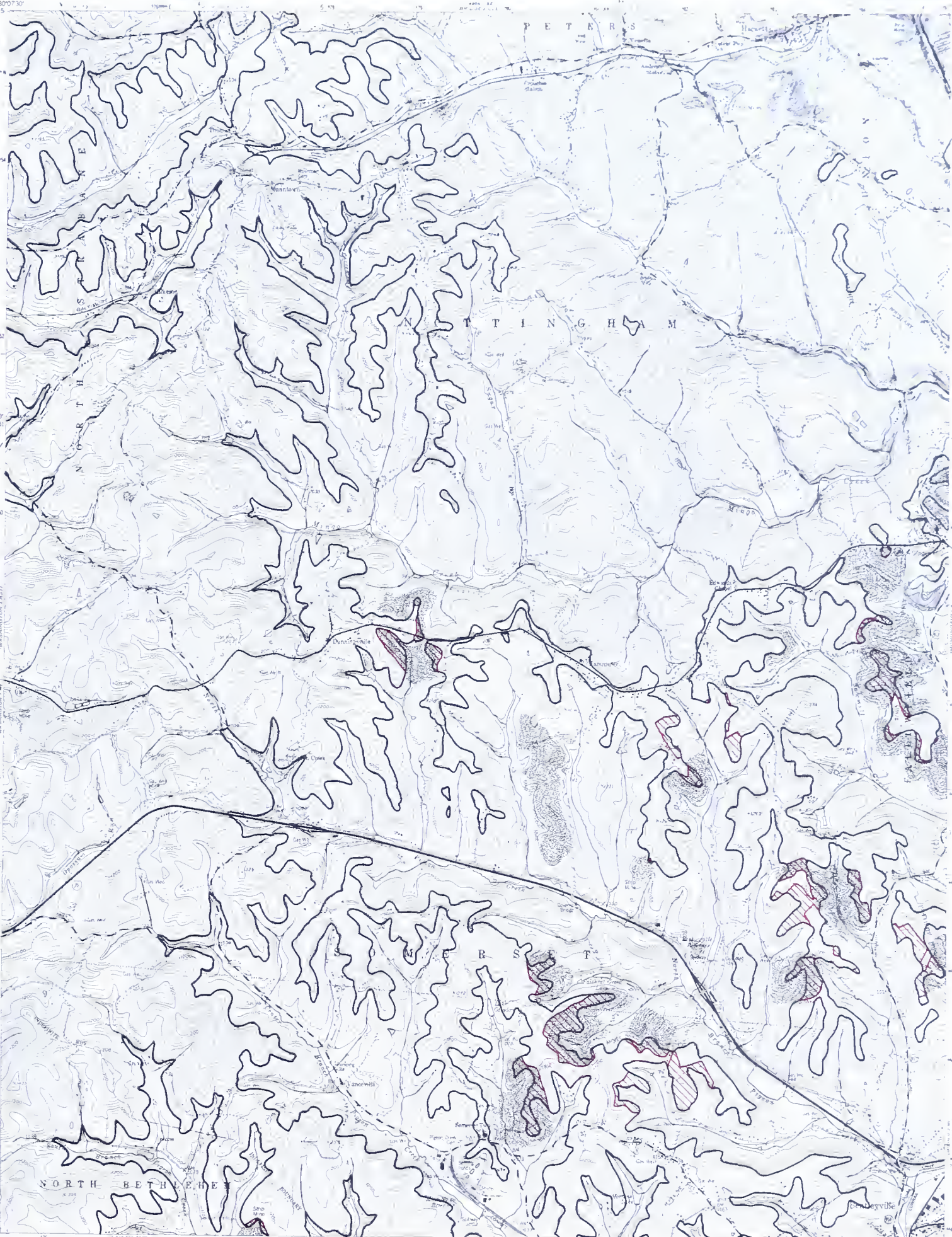
Crop line of the
Waynesburg "A"
coal



Extent of known
strip mining

MAP RELIABILITY

Coal crop line—good
Limits of known strip
mining—approximate



SOURCES

Crop line slightly modified by V. W. Skema from Kent, B. H. (1967). *Geologic map of the Hackett quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-630, scale 1:24 000. Limits of strip mining based on interpretation of topographic map and aerial photographs.



CONTour INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Main hwy. Light duty
Med. hwy. Light improved
Interstate hwy. State hwy.

HACKETT

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG "A" COAL



EXPLANATION

CROP LINES

- W —
Washington coal
- wBA —
Waynesburg "A" coal
- wb —
Waynesburg coal
- r —
Redstone coal
- p —
Pittsburgh coal

Anticline

Showing axial-plane trace and direction of plunge.

Syncline

Showing axial-plane trace and direction of plunge.

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

MAP RELIABILITY

Coal crop lines—good to very good
Structure contours—very good

SOURCE

Crop lines modified by V. W. Skema from Kent, B. H. (1967), *Geologic map of the Hackett quadrangle, Washington County, Pennsylvania*. U.S. Geological Survey Geologic Quadrangle Map GQ-630, scale 1:24,000.
Structure contours slightly modified by V. W. Skema from Kent (1967).

SCALE ~1:62,500

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION

Heavy-duty road Light-duty road
Medium-duty road Unimproved dirt road
Gravel Road State Road

PENNSYLVANIA
QUADRANGLE LOCATION

HACKETT

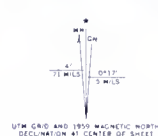
COAL CROP LINES AND STRUCTURE CONTOURS

Crop line of the
Waynesburg coal



MAP RELIABILITY
Coal crop line—good

Crop line by V. W. Skema based on interval from structure contours on the Pittsburgh coal modified from Consolidation Coal Company (1981), unpublished map.



SCALE ~1:62500



ROAD CLASSIFICATION

Heavy duty Light-duty
Medium-duty Unimproved dirt
 U. S. Route  State Route

MAJORSVILLE

CROP LINE OF THE WAYNESBURG COAL

EXPLANATION

CROP LINES

- W— Washington coal
- wbA— Waynesburg "A" coal
- wb— Waynesburg coal

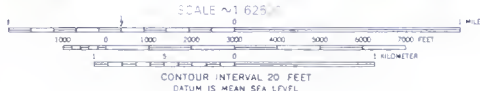
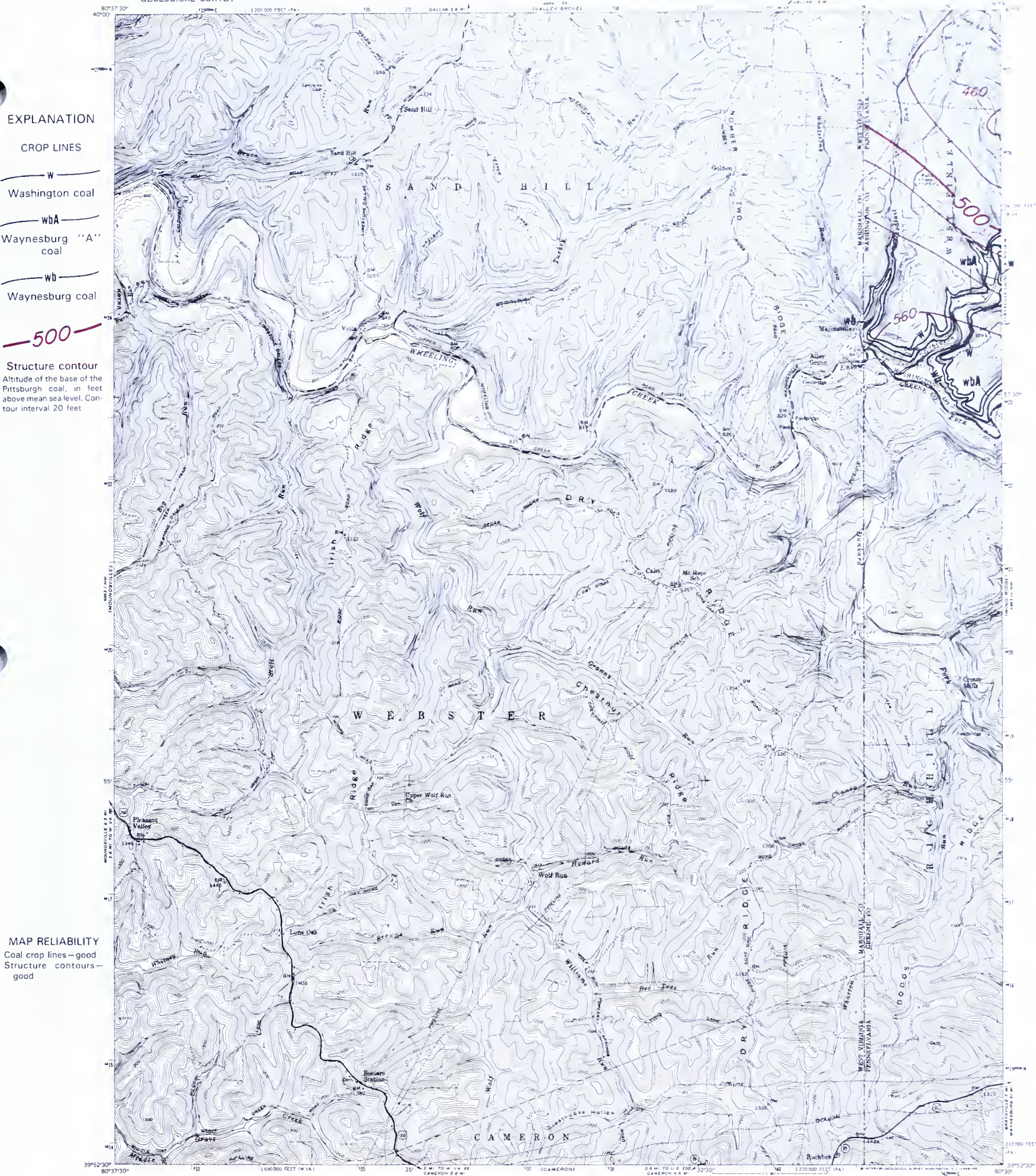
—500—

Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

MAP RELIABILITY
Coal crop lines—good
Structure contours—good

SOURCE

Crop lines by V. W. Skema based on intervals from structure contours.
Structure contours modified by V. W. Skema from Consolidation Coal Company (1981), unpublished map.



ROAD CLASSIFICATION

Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
U.S. Route	State Route

MAJORSVILLE

COAL CROP LINES AND
STRUCTURE CONTOURS

EXPLANATION



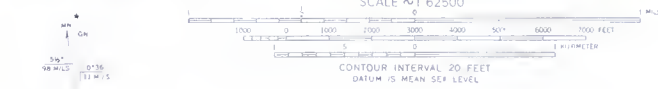
Extent of known
deep mining

MAP RELIABILITY
Limits of known deep
mining—approximate



SOURCE

Limits of deep mining modified by V. W. Skema from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.





ROAD CLASSIFICATION
Heavy duty ——— Light duty ———
Medium duty ——— Unimproved dirt ———
Ferry Route ———

MATHER

MINED-OUT AREAS OF THE
PITTSBURGH COAL

EXPLANATION

-  Crop line of the
Waynesburg coal
-  Extent of known
strip mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate



SOURCES

Crop line from Kent, B. H. (1969), *Geologic map of the Mather quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-826, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map and aerial photographs.

36° 18' 15" N
80° 07' 30" W
MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500
HORIZONTAL SCALE
VERTICAL SCALE
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy duty
Medium duty
Light duty
Unimproved
State Route

MATHER

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG COAL

EXPLANATION

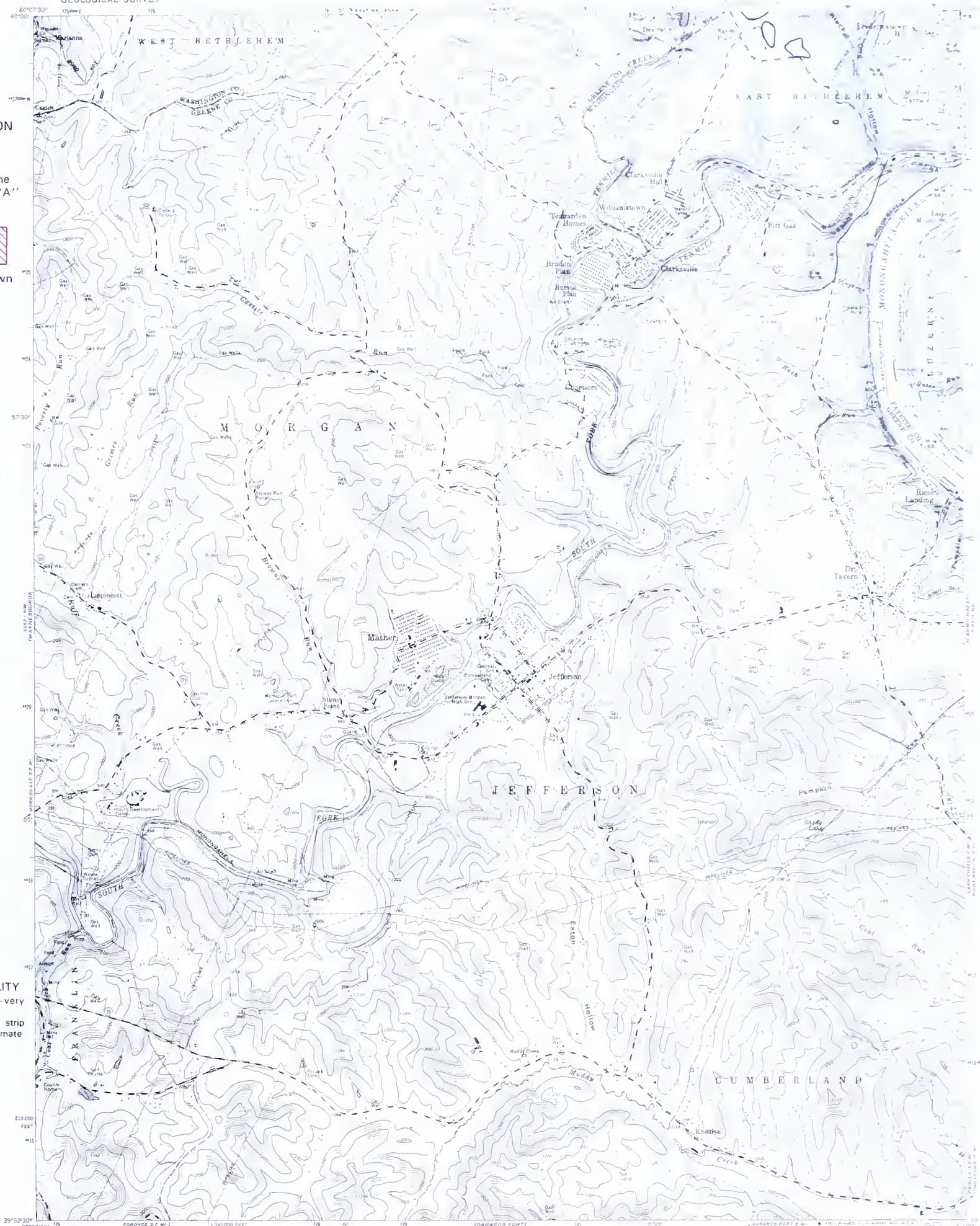
Crop line of the
Waynesburg "A"
coal

Extent of known
strip mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate

SOURCES

Crop line from Kent, B. H. (1969), *Geologic map of the Mather quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-826, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map.



UTM GRID AND 1973 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:62500
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy duty
Medium duty
Unimproved dirt
State Route

MATHER

CROP LINE AND MINED-OUT AREA OF THE
WAYNESBURG "A" COAL

EXPLANATION

CROP LINES

W

Washington coal

wbA

Waynesburg "A" coal

wb

Waynesburg coal

Anticline

Showing axial plane trace and direction of plunge.

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

800

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

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Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

Structure contour

Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

MAP RELIABILITY

Coal crop lines—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

Structure contours—very good

SOURCE

Crop lines and structure contours from Kent, B. H. (1969). *Geologic map of the Mather quadrangle, southwestern Pennsylvania*. U.S. Geological Survey Geologic Quadrangle Map GQ-826, scale 1:24,000.

UTM GRID AND 10-12 MINUTE DESIGNATION AT CENTER OF SHEET






ROAD CLASSIFICATION
Major Rd. 1:2
Minor Rd. 1:4
Unimproved 1:8

MATHER

COAL CROP LINES AND STRUCTURE CONTOURS

EXPLANATION

-  Crop line of the Pittsburgh coal
-  Extent of known strip mining
-  Extent of known deep mining

MAP RELIABILITY

- Coal crop line—very good
- Limits of known strip mining—approximate
- Limits of known deep mining—approximate

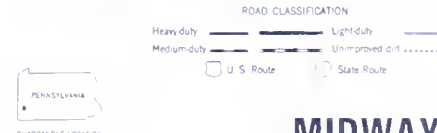
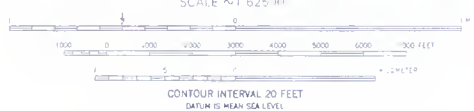
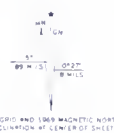


SOURCES

Crop line from Roen, J. B. (1973), *Geologic map of the Midway quadrangle, Washington County, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-1067, scale 1:24,000.

Limits of strip mining based on interpretation of topographic map and aerial photographs.

Limits of deep mining modified by V. W. Skema from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



MIDWAY

CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL

EXPLANATION

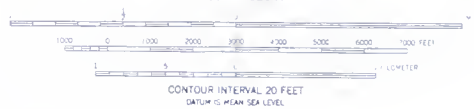
- Crop line of the
Waynesburg coal
- Extent of known
strip mining

MAP RELIABILITY

- Coal crop line—very
good
Limits of known strip
mining—approximate

SOURCES

Crop line from Roen, J. B. (1973), *Geologic map of the Midway quadrangle, Washington County, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-1067, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map.



- ROAD CLASSIFICATION
- Heavy-duty ——— Light-duty ———
Medium-duty ——— Unimproved dirt ———
U.S. Route ——— State Route ———



MIDWAY

CROP LINE AND MINED-OUT AREA OF THE
WAYNESBURG COAL

EXPLANATION

CROP LINES

- W —
Washington coal
- WbA —
Waynesburg "A" coal
- Wb —
Waynesburg coal
- P —
Pittsburgh coal

- Anticline
Showing axial-plane trace and direction of plunge

- Syncline
Showing axial-plane trace and direction of plunge

- 900 —
Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

- MAP RELIABILITY
Coal crop lines—very good
Structure contours—very good

SOURCE

Crop lines from Roen, J. B. (1973), *Geologic map of the Midway quadrangle, Washington County, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-1067, scale 1:24,000.
Structure contours slightly modified by V. W. Skema from Roen (1973).

CLAYSVILLE ANTICLINE

FINNEY SYNCLINE

ROAD CLASSIFICATION

- Heavy-duty
- Medium-duty
- Light-duty
- Unimproved dirt
- U.S. Route
- State Route



CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1983 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET




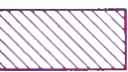

QUADRANGLE LOCATION

COAL CROP LINES AND STRUCTURE CONTOURS

MIDWAY



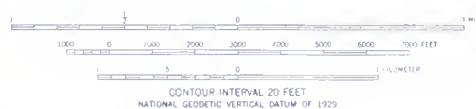
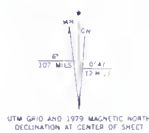
EXPLANATION

-  Crop line of the Pittsburgh coal
-  Extent of known strip mining
-  Extent of known deep mining

MAP RELIABILITY
Coal crop line—very good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line modified by V. W. Skema from Roen, J. B., Kent, B. H., and Schweinfurth, S. P. (1968), *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000.
Limits of strip mining from Roen and others (1968) and interpretation of topographic map.
Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



- ROAD CLASSIFICATION
- Heavy-duty
 - Medium-duty
 - Light-duty
 - Unimproved dirt
 - U.S. Route
 - State Route
 - Interstate Route



MONONGAHELA

CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL



EXPLANATION

- Crop line of the Redstone coal
- Limit of Redstone coal deposition
- Extent of known strip mining

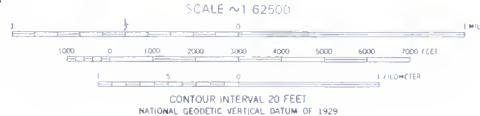
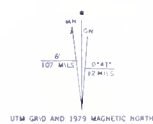
MAP RELIABILITY

- Coal crop line—very good
- Limits of known strip mining—approximate



SOURCES

Crop line slightly modified by V. W. Skema from Roen, J. B., Gent, B. H., and Schweinfurth, S. P. (1968). *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000. Limits of strip mining from Roen and others (1968) and interpretation of topographic map.



MONONGAHELA

CROP LINE AND MINED-OUT AREAS OF THE
REDSTONE COAL



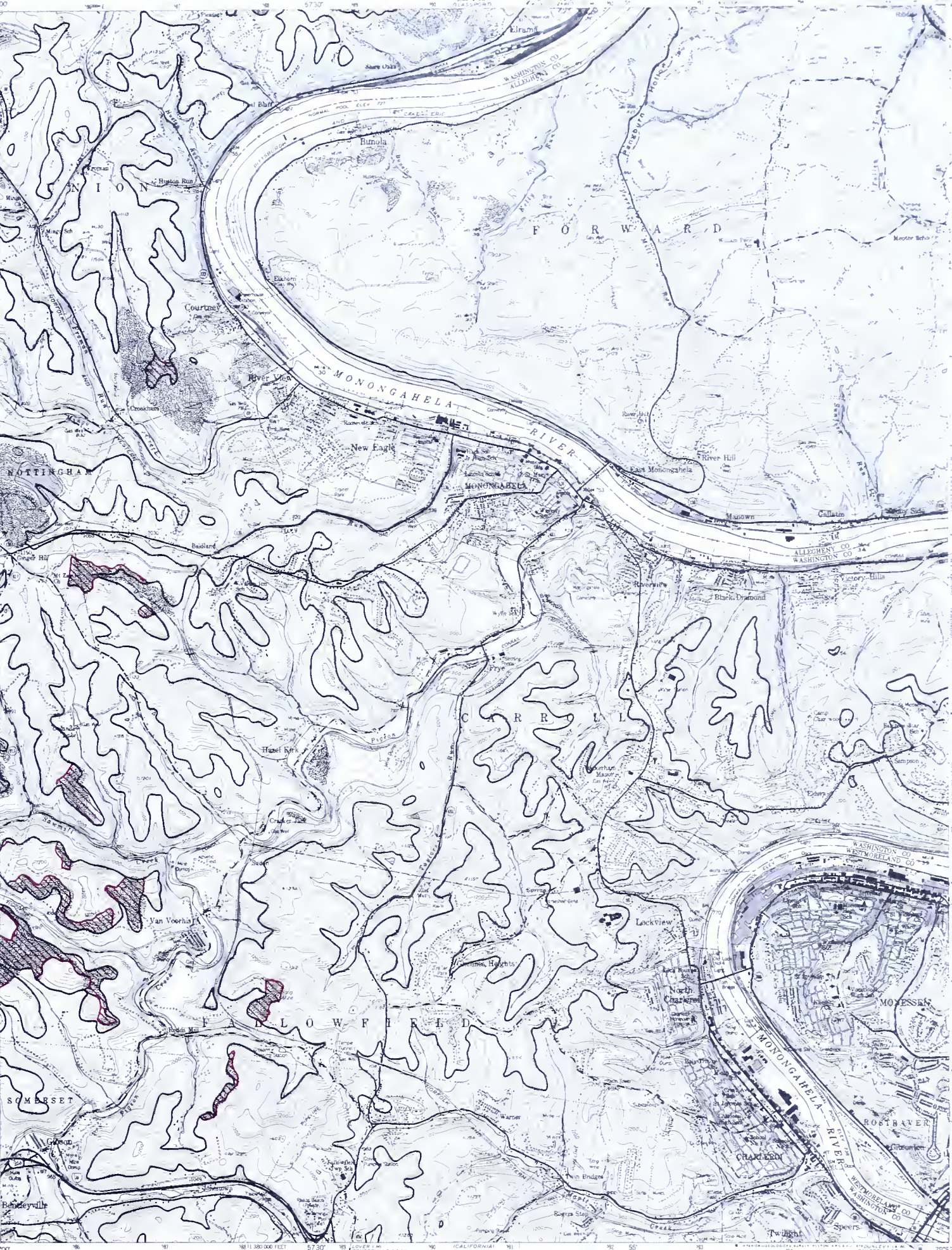
EXPLANATION

Crop line of the
Waynesburg coal



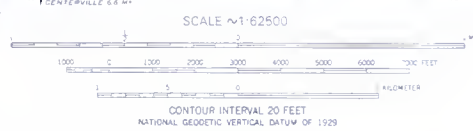
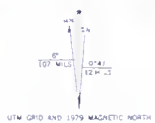
Extent of known
strip mining

MAP RELIABILITY
Coal crop line—good
to very good
Limits of known strip
mining—approximate



SOURCES

Crop line from Roen, J. B., Kent, B. H., and Schweinfurth, S. P. (1968), *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000.
Limits of strip mining based on interpretation of topographic map.



MONONGAHELA

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG COAL



EXPLANATION

Crop line of the
Waynesburg "A"
coal

Extent of known
strip mining

MAP RELIABILITY
Coal crop line—good
to very good
Limits of known strip
mining—approximate



SOURCES

Crop line from Roen, J. B., Kent, B. H., and Schweinfurth, S. P. (1968). *Geologic map of the Monongahela quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-743, scale 1:24,000. Limits of strip mining based on interpretation of topographic map.

UTM GRID AND 1975 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U.S. Route
State Route
Interstate Route

PENNSYLVANIA
QUADRANGLE LOCATION

MONONGAHELA

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG "A" COAL

EXPLANATION

CROP LINES

—w—
Washington coal

—wbA—
Waynesburg "A" coal

—wb—
Waynesburg coal

—r—
Redstone coal

—p—
Pittsburgh coal

↕
Anticline
Showing axial-plane trace
and direction of plunge.

↖
Syncline
Showing axial-plane trace
and direction of plunge.

—800—
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY

Coal crop line—good
to very good
Structure contours—
good to very good

SOURCE

Crop lines modified by V. W. Skema from Roen, J. B., Kent,
B. H., and Schweinfurth, S. P. (1968), *Geologic map of the
Monongahela quadrangle, southwestern Pennsylvania*, U.S.
Geological Survey Geologic Quadrangle Map GQ-743, scale
1:24,000.
Structure contours from Roen and others (1968).

SCALE 1:62,500

CONTOUR INTERVAL 20 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1975 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION
Heavy duty
Medium duty
Light duty
Unimproved dirt
U.S. Route
State Route
Interstate Route

MONONGAHELA

COAL CROP LINES AND STRUCTURE CONTOURS



EXPLANATION

-  Crop line of the Pittsburgh coal
-  Extent of known strip mining
-  Extent of known deep mining

MAP RELIABILITY

- Coal crop line—very good
- Limits of known strip mining—approximate
- Limits of known deep mining—approximate



SOURCES

- Crop line by V. W. Skema based on structure contours compiled from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000, and from contours extended from adjacent area (Dodge, C. H., compiler (1985), *Coal resources of Allegheny County, Pennsylvania—Part 1, Coal crop lines, mined-out areas, and structure contours*, Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 89, Part 1, p. 61).
- Limits of strip mining based on interpretation of topographic map.
- Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

OAKDALE



EXPLANATION

— p —
Crop line of the
Pittsburgh coal

1060
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

MAP RELIABILITY
Coal crop line—very
good
Structure contours—
very good



SOURCES

Crop line based on structure contours.
Structure contours compiled by V. W. Skema from Wagner,
p. V. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pitts-
burgh Region structure contour map*, Pennsylvania Geological
Survey, 4th ser., Map 43, scale 1:125,000, and from contours
extended from adjacent area (Dodge, C. H., compiler (1985),
*Coal resources of Allegheny County, Pennsylvania—Part 1, Coal
crop lines, mined-out areas, and structure contours*, Penn-
sylvania Geological Survey, 4th ser., Mineral Resource Report
89, Part 1, p. 61).

COAL CROP LINE AND STRUCTURE CONTOURS

OAKDALE

EXPLANATION



Extent of known
deep mining

MAP RELIABILITY

Limits of known deep
mining—approximate

SOURCE

Limits of deep mining modified by V. W. Skema from Penn-
sylvania Department of Environmental Resources, Bureau of
Mining and Reclamation (1978), unpublished map.

UTM GRID AND 1973 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION
Heavy-duty ——— Light-duty ———
Medium-duty ——— Unimproved dirt ———
○ Interstate Route ○ State Route

PENNSYLVANIA
QUADRANGLE LOCATION

PROSPERITY

**MINED-OUT AREAS OF THE
PITTSBURGH COAL**

EXPLANATION

— W —
Crop line of the
Washington coal

Anticline
Showing axial-plane trace
and direction of plunge.

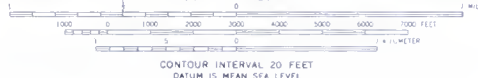
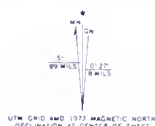
Syncline
Showing axial-plane trace
and direction of plunge

— 500 —
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY

Coal crop line—very
good
Structure contours—
very good

SOURCES
Crop line from Kent, B. H. (1972). *Geologic map of the Prosperity quadrangle, southwestern Pennsylvania*, U. S. Geological Survey Geologic Quadrangle Map GQ-1003, scale 1:24,000.
Structure contours modified by V. W. Skema from Roen, J. B., and Farrel, D. E. (1980). *Structure contour map of the base of the Pittsburgh coal bed, southwestern Pennsylvania and northern West Virginia*, U. S. Geological Survey Coal Investigations Map C-88, scale 1:125,000.



COAL CROP LINE AND STRUCTURE CONTOURS

PROSPERITY

EXPLANATION

— 420 —
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY
Structure contours—
very good

SOURCE
Structure contours compiled by V. W. Skema from unpublished
data

UTM GRID AND 1973 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET


SCALE 1:62500
1 INCH = 1 MILE
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy-duty Light-duty
Medium-duty Unimproved
State Route

STRUCTURE CONTOURS

ROGERSVILLE

EXPLANATION

-  Crop line of the Pittsburgh coal
-  Extent of known strip mining
-  Extent of known deep mining

MAP RELIABILITY
Coal crop line—very good
Limits of known strip mining—approximate
Limits of known deep mining—approximate

SOURCES

Crop line modified by V. W. Skema from Schweinfurth, S. P. (1976), *Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000.
Limits of strip mining from Schweinfurth (1976) and interpretation of topographic map and aerial photographs.
Limits of deep mining from unpublished mine maps, including Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

CROP LINE AND MINED-OUT AREAS OF THE
PITTSBURGH COAL

STEBENVILLE
EAST



ROAD CLASSIFICATION
Primary highway all weather hard surface
Secondary highway all weather hard surface
Light duty road all weather improved surface
Unimproved road fair or dry weather
U.S. Route
State Route

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10 FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1978 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

EXPLANATION

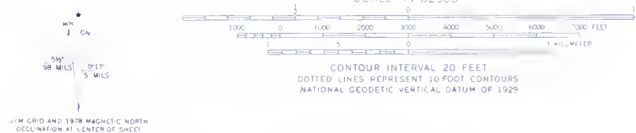

Crop line of the
Waynesburg coal

MAP RELIABILITY
Coal crop line—very
good



SOURCE

Crop line from Schweinfurth, S. P. (1976), *Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000.



ROAD CLASSIFICATION
Primary highway all weather, Light duty road all weather
hard surface Improved surface
Secondary highway all weather Unimproved road fair or dry
hard surface weather
U S Route State Route

CROP LINE OF THE
WAYNESBURG COAL

STEBENVILLE
EAST

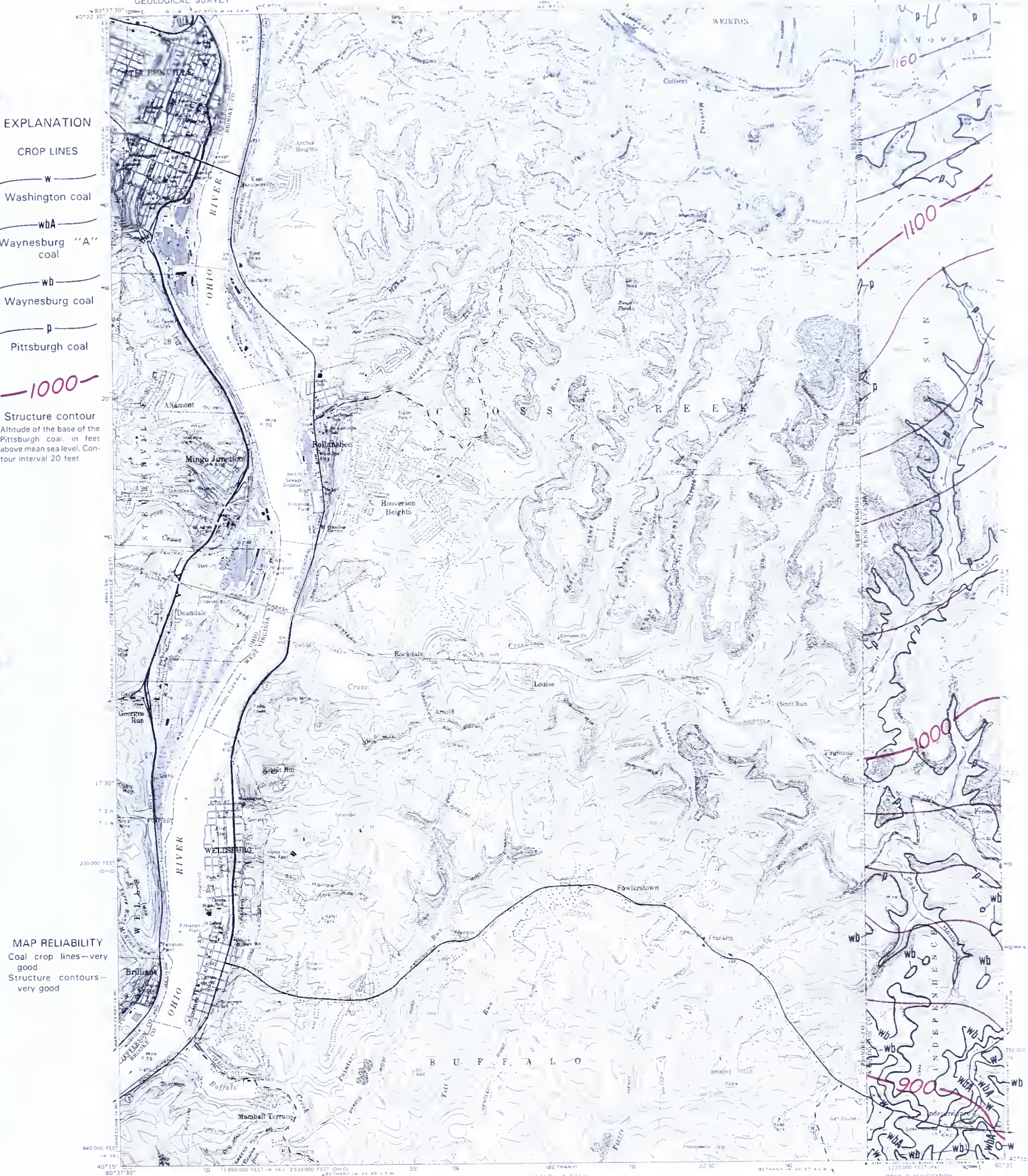
EXPLANATION

CROP LINES

- W— Washington coal
- wbA— Waynesburg "A" coal
- wb— Waynesburg coal
- p— Pittsburgh coal

—1000—
Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet

MAP RELIABILITY
Coal crop lines—very good
Structure contours—very good



SOURCE

Crop lines modified by V. W. Skema from Schweinfurth, S. P. et al. (1976), *Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000.
Structure contours from Schweinfurth (1976).



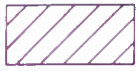
ROAD CLASSIFICATION

Primary highway all weather hard surface	Light duty road all weather improved surface
Secondary highway all weather hard surface	Unimproved road fair or dry weather
U.S. Route	State Route

COAL CROP LINES AND STRUCTURE CONTOURS

STEBENVILLE EAST

EXPLANATION



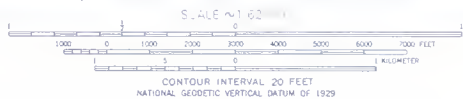
Extent of known
deep mining

MAP RELIABILITY
Limits of known deep
mining—approximate

SOURCE

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

UTM GRID AND 1981 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET




MINED-OUT AREAS OF THE
PITTSBURGH COAL

VALLEY GROVE

EXPLANATION

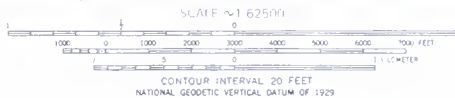
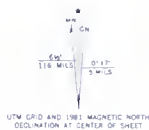
 Syncline
Showing axial-plane trace
and direction of plunge.

 600
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

MAP RELIABILITY
Structure contours—
good

SOURCE

Structure contours compiled by V. W. Skema from unpublished
data



ROAD CLASSIFICATION	
Primary highway hard surface	Light-duty road, hard or improved surface
Secondary highway hard surface	Unimproved road
 Interstate Route	 U.S. Route
	 State Route

STRUCTURE CONTOURS

VALLEY GROVE

EXPLANATION

Crop line of the
Pittsburgh coal

Extent of known
strip mining

Extent of known
deep mining

MAP RELIABILITY

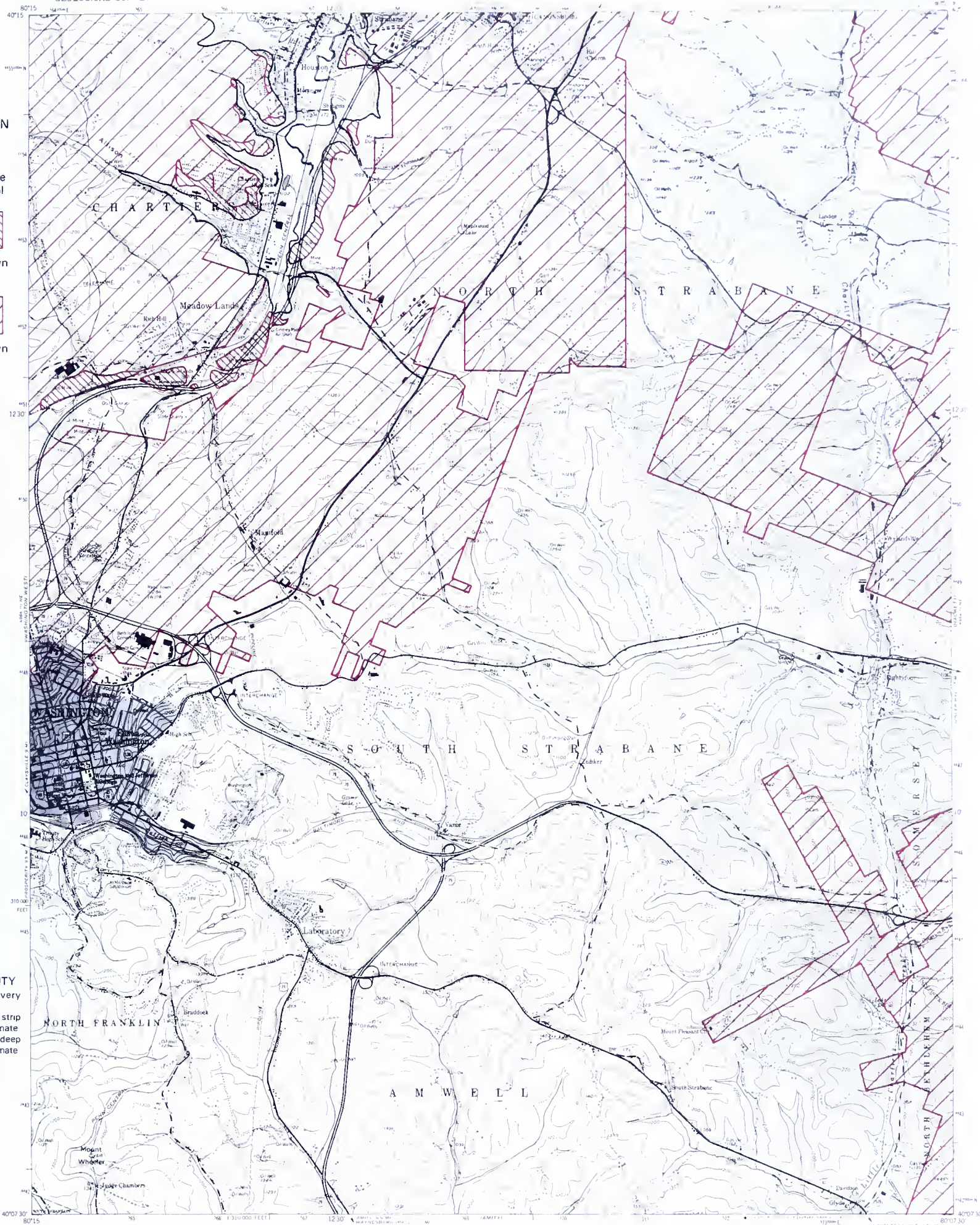
Coal crop line—very
good
Limits of known strip
mining—approximate
Limits of known deep
mining—approximate

SOURCES

Crop line slightly modified by V. W. Skema from Swanson, V. E., and Berryhill, H. L., Jr. (1964), *Geology of the Washington East quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-334, scale 1:24,000. Limits of strip mining from Swanson and Berryhill (1964) and interpretation of topographic map. Limits of deep mining modified by V. W. Skema from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

WASHINGTON EAST



SCALE ~ 1:62,500

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Heavy duty ——— Light duty ———
Medium duty ——— Improved dirt ———
U.S. Route ——— State Route ———
Interstate Route ———

PENNSYLVANIA
GEOLOGICAL SURVEY

EXPLANATION

Crop line of the
Waynesburg coal

MAP RELIABILITY
Coal crop line—very
good



SOURCE

Crop line from Swanson, V. E., and Berryhill, H. L., Jr. (1964).
Geology of the Washington East quadrangle, Pennsylvania, U.S.
Geological Survey Geologic Quadrangle Map GQ-334, scale
1:24,000.

UTM GRID AND 1965 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET
0 0 1 2 3 4 5 6 7 8 9 10
KILOMETERS

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Heavy-duty ——— Light-duty ———
Medium-duty ——— Unimproved dirt ———
U.S. Route ——— State Route ———
Interstate Route ———



WASHINGTON
EAST

CROP LINE OF THE
WAYNESBURG COAL

EXPLANATION

CROP LINES

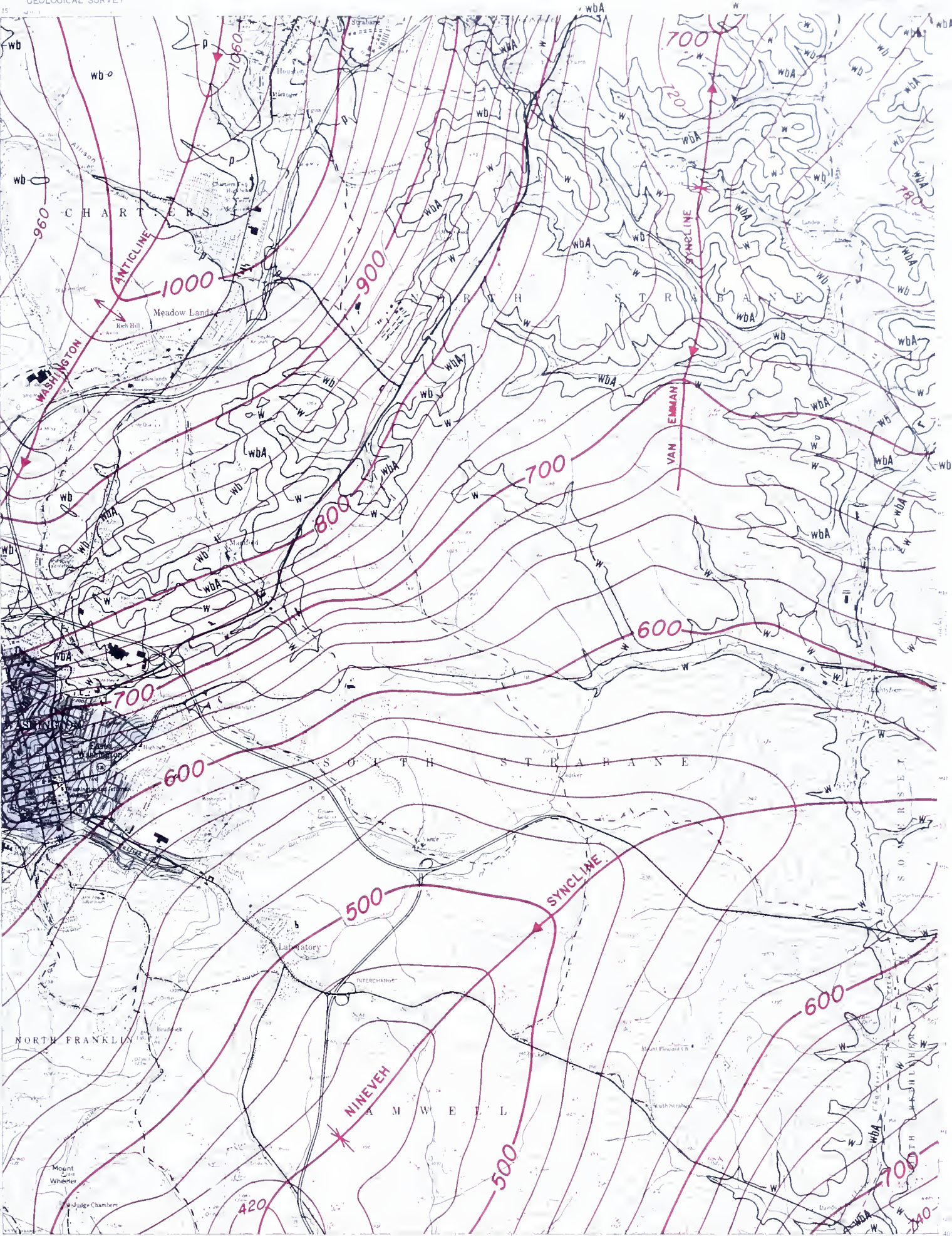
- W —
Washington coal
- wbA —
Waynesburg "A" coal
- wb —
Waynesburg coal
- p —
Pittsburgh coal

Anticline
Showing axial-plane trace
and direction of plunge.

Syncline
Showing axial-plane trace
and direction of plunge.

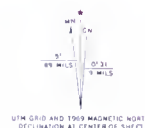
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

MAP RELIABILITY
Coal crop lines—very
good
Structure contours—
very good



SOURCES

Crop lines slightly modified by V. W. Skema from Swanson, V. E., and Berryhill, H. L., Jr. (1964), *Geology of the Washington East quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-334, scale 1:24,000.
Structure contours from Berryhill, H. L., Jr., Schweinfurth, S. P., and Kent, B. H. (1971), *Coal-bearing Upper Pennsylvanian and Lower Permian rocks, Washington area, Pennsylvania—Part 1, Lithofacies; Part 2, Economic and engineering geology*, U.S. Geological Survey Professional Paper 621, Plate 1.



SCALE 1:62,500

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL



ROAD CLASSIFICATION
Heavy duty ——— Light duty ———
Medium duty ——— Unimproved dirt ———
U.S. Route ——— State Route ———
Interstate Route ———

**WASHINGTON
EAST**

**COAL CROP LINES AND
STRUCTURE CONTOURS**

EXPLANATION



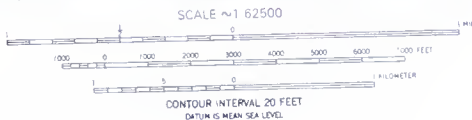
Extent of known
deep mining

MAP RELIABILITY
Limits of known deep
mining—approximate

SOURCE

Limits of deep mining modified by V. W. Skema from Penn-
sylvania Department of Environmental Resources, Bureau of
Mining and Reclamation (1978), unpublished map.

UTM GRID AND 1968 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



WASHINGTON
WEST

MINED-OUT AREAS OF THE
PITTSBURGH COAL

EXPLANATION

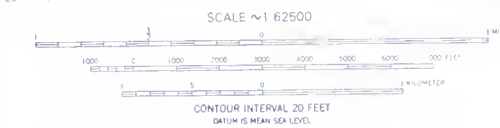
- Crop line of the
Waynesburg coal
- Extent of known
strip mining

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate

SOURCES

Crop line from Berryhill, H. L., Jr., and Swanson, V. E. (1964),
Geology of the Washington West quadrangle, Pennsylvania,
U.S. Geological Survey Geologic Quadrangle Map GQ-283,
scale 1:24,000.
Limits of strip mining based on interpretation of topographic
map.

UTM GRID AND 1983 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



RELATION ASSOCIATION

Heavy duty ——— Light duty ———

Medium duty ——— State Road ———

U.S. Route ———

WASHINGTON
WEST

CROP LINE AND MINED-OUT AREAS OF THE
WAYNESBURG COAL

EXPLANATION

CROP LINES

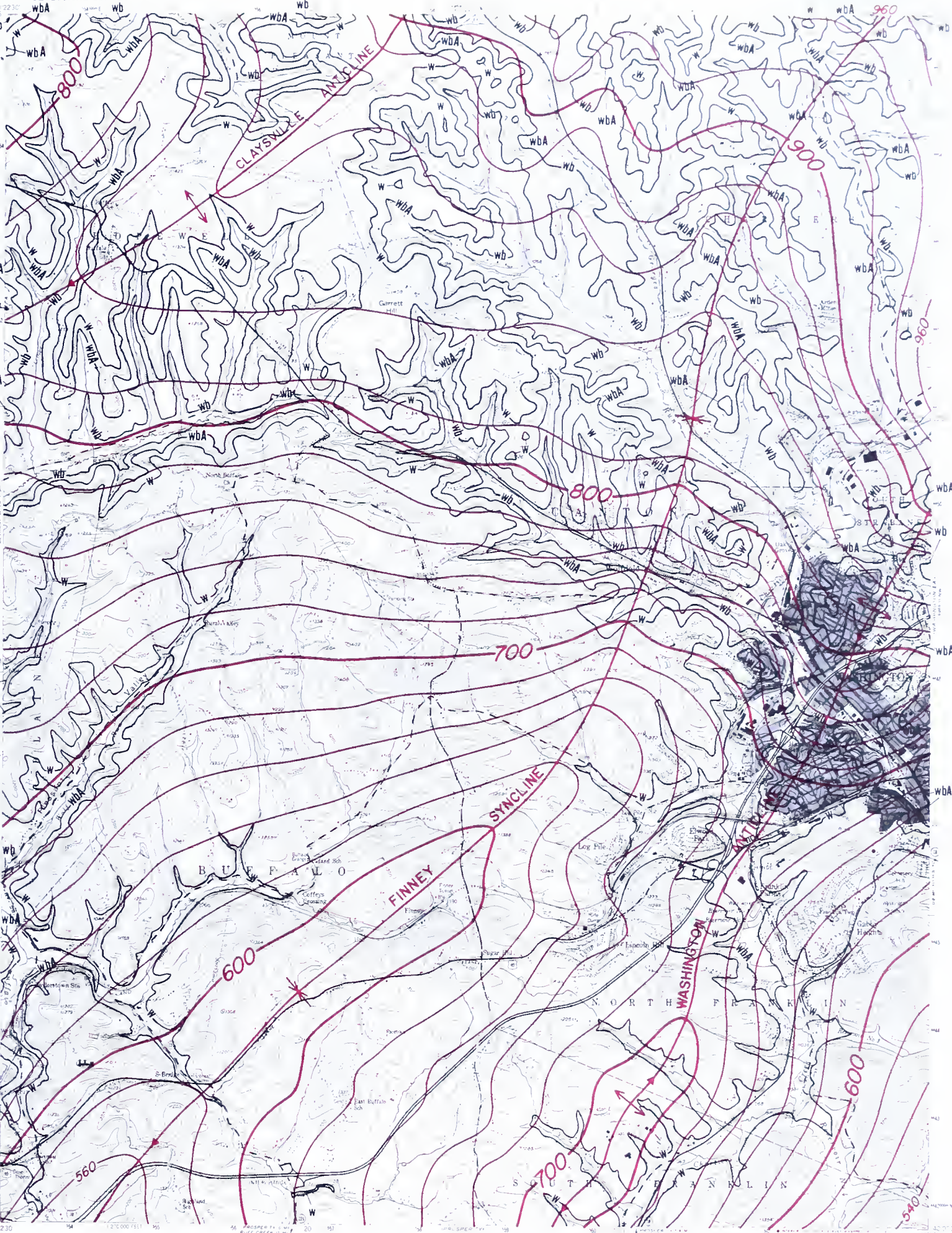
- W —
Washington coal
- wBA —
Waynesburg coal "A"
- wb —
Waynesburg coal

- ↔
Anticline
Showing axial-plane trace
and direction of plunge.

- ↔
Syncline
Showing axial-plane trace
and direction of plunge.

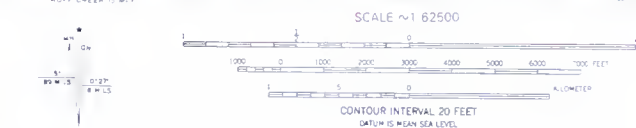
- 700 —
Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet.

- MAP RELIABILITY
Coal crop lines—very
good
Structure contours—
very good



SOURCES

Crop lines slightly modified by V. W. Skema from Berryhill, H. L., Jr., and Swanson, V. E. (1964), *Geology of the Washington West quadrangle, Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-283, scale 1:24,000. Structure contours modified by V. W. Skema from Berryhill, H. L., Jr., Schweinfurth, S. P., and Kent, B. H. (1971), *Coal-bearing Upper Pennsylvanian and Lower Permian rocks, Washington area, Pennsylvania—Part 1, Lithofacies; Part 2, Economic and engineering geology*, U.S. Geological Survey Professional Paper 621, Plate 1.



COAL CROP LINES AND STRUCTURE CONTOURS

WASHINGTON WEST

EXPLANATION



Extent of known
deep mining

MAP RELIABILITY
Limits of known deep
mining—approximate

SOURCE

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.

WAYNESBURG

MINED-OUT AREA OF THE
PITTSBURGH COAL



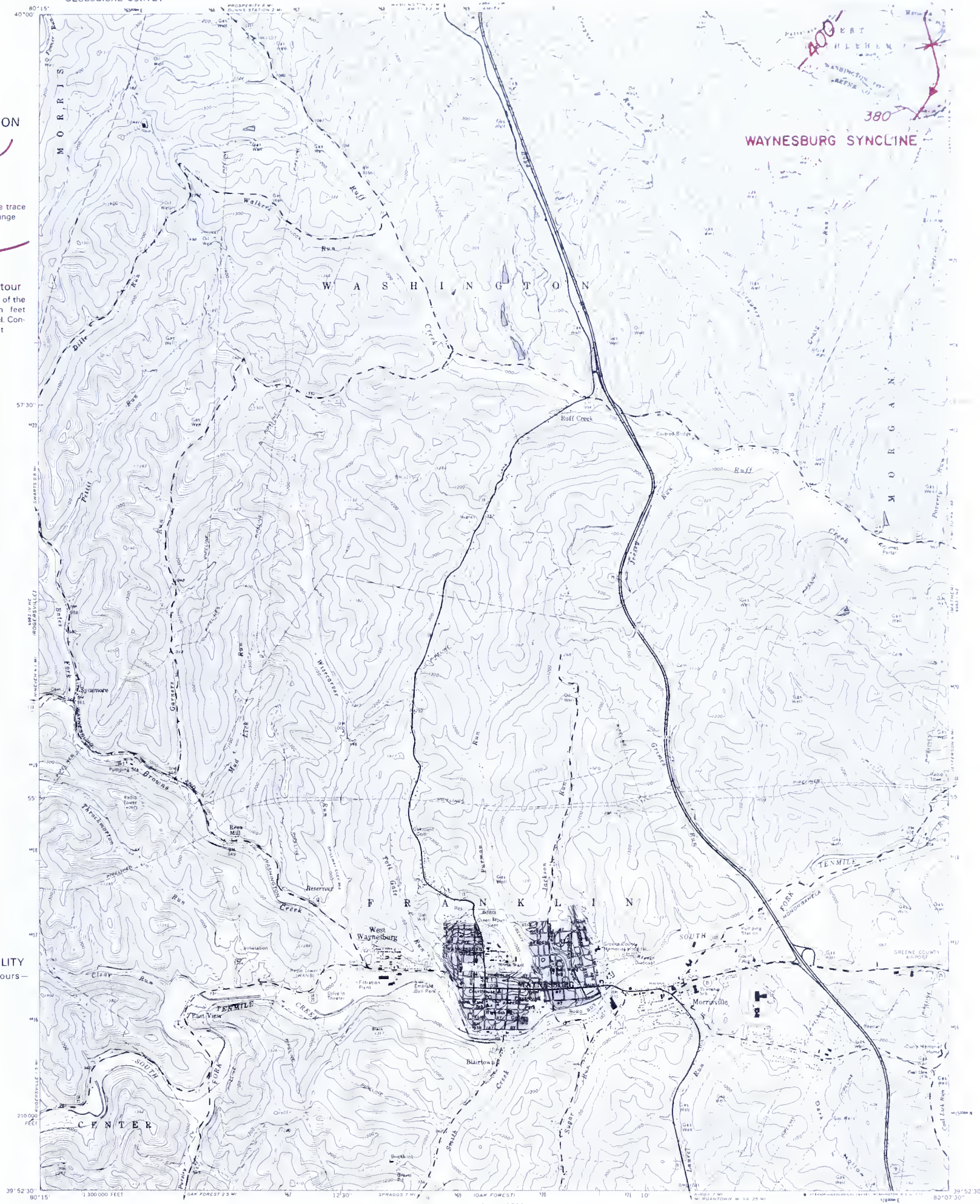
EXPLANATION

Syncline
Showing axial-plane trace
and direction of plunge

Structure contour
Altitude of the base of the
Pittsburgh coal, in feet
above mean sea level. Con-
tour interval 20 feet

MAP RELIABILITY
Structure contours—
very good

WAYNESBURG SYNCLINE



SOURCE

Structure contours from Roen, J. B. (1970). *Geologic map of the Waynesburg quadrangle, southwestern Pennsylvania*, U.S. Geological Survey Geologic Quadrangle Map GQ-83B, scale 1:24,000.

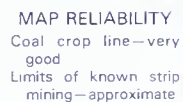


ROAD CLASSIFICATION

Heavy duty	Light duty
Medium duty	Unimproved dirt
U.S. Route	State Route

STRUCTURE CONTOURS

WAYNESBURG



Crop line by V. W. Skema based on structure contours slightly modified from Wagner, W. R., Heyman, L., Craft, J. L., and others (1975), *Greater Pittsburgh Region structure contour map*, Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000.

Limits of strip mining based on interpretation of topographic map and aerial photographs.

CROP LINE AND MINED-OUT AREAS OF THE PITTSBURGH COAL

WEIRTON

EXPLANATION

—p—
Crop line of the
Pittsburgh coal

—1200—
Structure contour

Altitude of the base of the
Pittsburgh coal in feet
above mean sea level. Con-
tour interval 20 feet.

MAP RELIABILITY

Coal crop line—very
good
Structure contours—
very good

SOURCE

Crop line by V. W. Skema based on structure contours.
Structure contours slightly modified by V. W. Skema from
Wagner, W. R., Heyman, L., Craft, J. L., and others (1975),
Greater Pittsburgh Region structure contour map, Pennsylvania
Geological Survey, 4th ser., Map 43, scale 1:125,000.

COAL CROP LINE AND STRUCTURE CONTOURS

WEIRTON

EXPLANATION

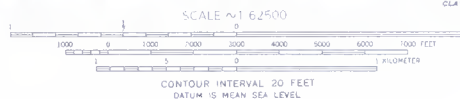
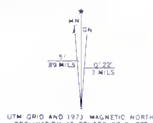


Extent of known
deep mining

MAP RELIABILITY
Limits of known deep
mining—approximate

SOURCE

Limits of deep mining from Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation (1978), unpublished map.



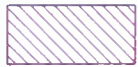
ROAD CLASSIFICATION	
Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
Interstate Route	U.S. Route
	State Route

WEST MIDDLETON

MINED-OUT AREA OF THE
PITTSBURGH COAL

EXPLANATION

Crop line of the
Waynesburg coal



Extent of known
strip mining

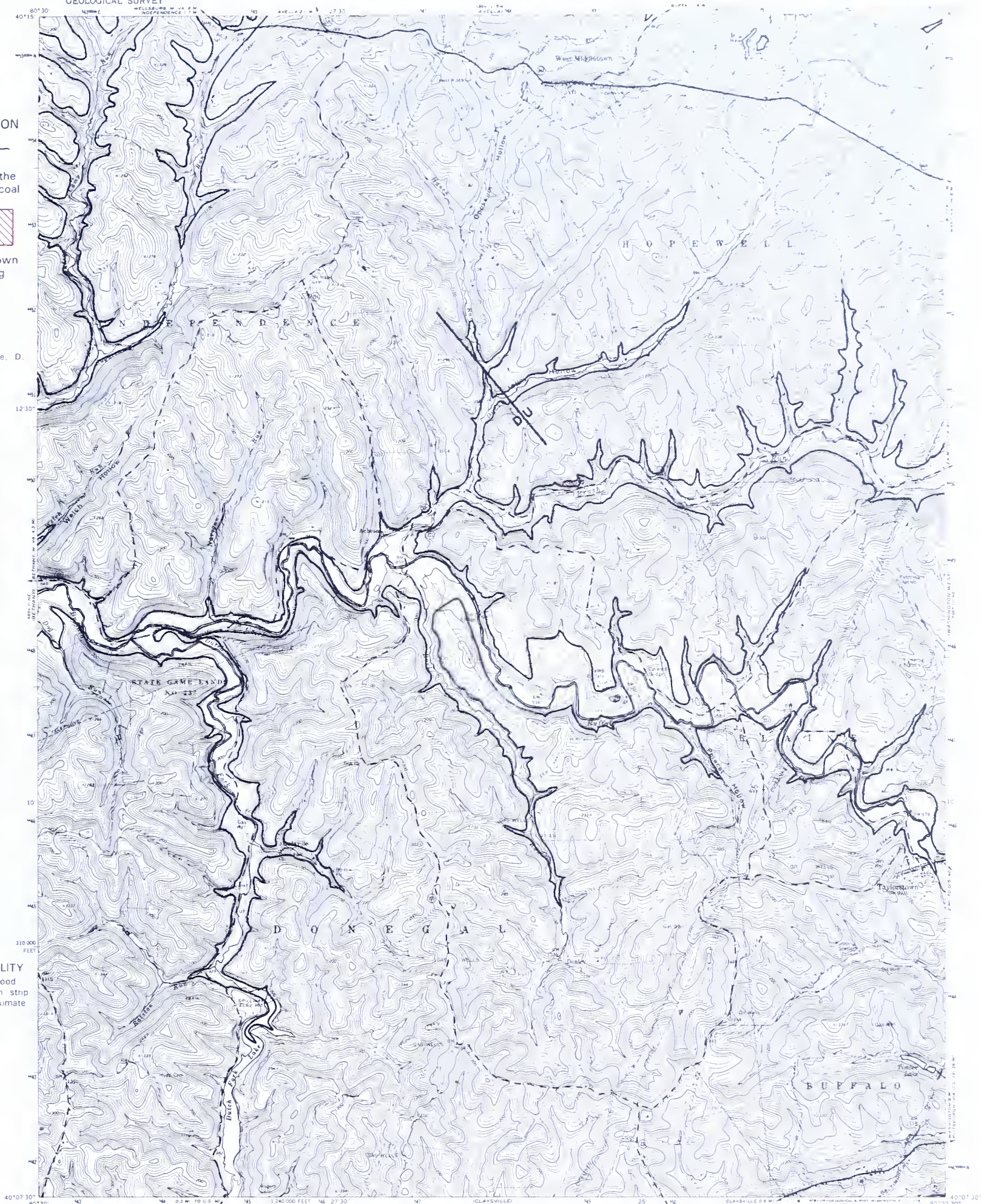


Fault

U, upthrown side, D,
downthrown side.

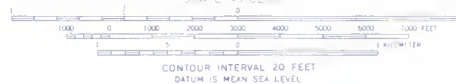
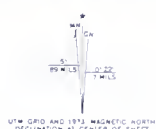
MAP RELIABILITY

Coal crop line—good
Limits of known strip
mining—approximate



SOURCE

Crop line and limits of strip mining from Schweinfurth, S. P. (1975). *Geologic map of the West Middletown quadrangle, and part of the Bethany quadrangle, Washington County, Pennsylvania*. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-871, scale 1:24,000.



ROAD CLASSIFICATION
Heavy-duty ——— Light-duty ———
Medium-duty ——— Unimproved dirt ———
○ Interstate Route ○ U.S. Route ○ State Route

WEST MIDDLETOWN

CROP LINE AND MINED-OUT AREA OF THE
WAYNESBURG COAL

EXPLANATION

Crop line of the
Washington coal

Extent of known
strip mining

Fault
U, upthrown side, D,
downthrown side.

MAP RELIABILITY
Coal crop line—very
good
Limits of known strip
mining—approximate

SOURCE

Crop line and limits of strip mining from Schweinfurth, S. P. (1975), *Geologic map of the West Middletown quadrangle, and part of the Bethany quadrangle, Washington County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-871, scale 1:24,000.



UTM GRID AND 1983 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION
Heavy duty ——— Light-duty ———
Medium-duty ——— Unimproved d.t. ———
○ Interstate Route □ U.S. Route ○ State Route

WEST MIDDLETOWN

CROP LINE AND MINED-OUT AREA OF THE
WASHINGTON COAL

EXPLANATION

CROP LINES

—W—
Washington coal

—wbA—
Waynesburg "A" coal

—wb—
Waynesburg coal

—DU—
Fault
U, upthrown side, D, downthrown side

↔
Anticline
Showing axial-plane trace and direction of plunge.

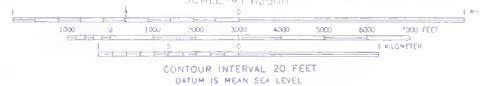
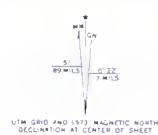
↔
Syncline
Showing axial-plane trace and direction of plunge

—600—
Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

MAP RELIABILITY
Coal crop lines—good
Structure contours—good

SOURCE

Crop lines slightly modified by V. W. Skema from Schweinfurth, S. P. (1975). *Geologic map of the West Middletown quadrangle, and part of the Bethany quadrangle, Washington County, Pennsylvania*, U. S. Geological Survey Miscellaneous Geologic Investigations Map I-871, scale 1:24,000. Structure contours modified by V. W. Skema from Schweinfurth (1975).



ROAD CLASSIFICATION	
Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
Interstate Route	U. S. Route
	State Route

WEST MIDDLETOWN

COAL CROP LINES AND
STRUCTURE CONTOURS

Crop line of the
Waynesburg coal



MAP RELIABILITY
Coal crop line—good



Crop line modified by V. W. Skema from Clapp, F. G. (1907),
Logansville folia, U.S. Geological Survey Geologic Atlas of the
 U.S., Folio 146, 14 p.

UTM GRID AND 1973 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

CROP LINE OF THE WAYNESBURG COAL

WIND RIDGE



- EXPLANATION**
- CROP LINES**
- W
Washington coal
- wbA
Waynesburg "A" coal
- wB
Waynesburg coal
- Anticline
Showing axial-plane trace and direction of plunge.
- Syncline
Showing axial-plane trace and direction of plunge.
- 500
Structure contour
Altitude of the base of the Pittsburgh coal, in feet above mean sea level. Contour interval 20 feet.

MAP RELIABILITY
Coal crop lines—good
Structure contours—good



SOURCES

Crop lines modified by V. W. Skema from Clapp, F. G. (1907). *Rogersville folio*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 146, 14 p.
Structure contours modified by V. W. Skema from Consolidation Coal Company (1981), unpublished map.



ROAD CLASSIFICATION

Heavy duty	Light duty
Medium duty	Unimproved dirt
State Route	

WIND RIDGE

**COAL CROP LINES AND
STRUCTURE CONTOURS**

